The Journal
OF THE KANSAS MEDICAL SOCIETY

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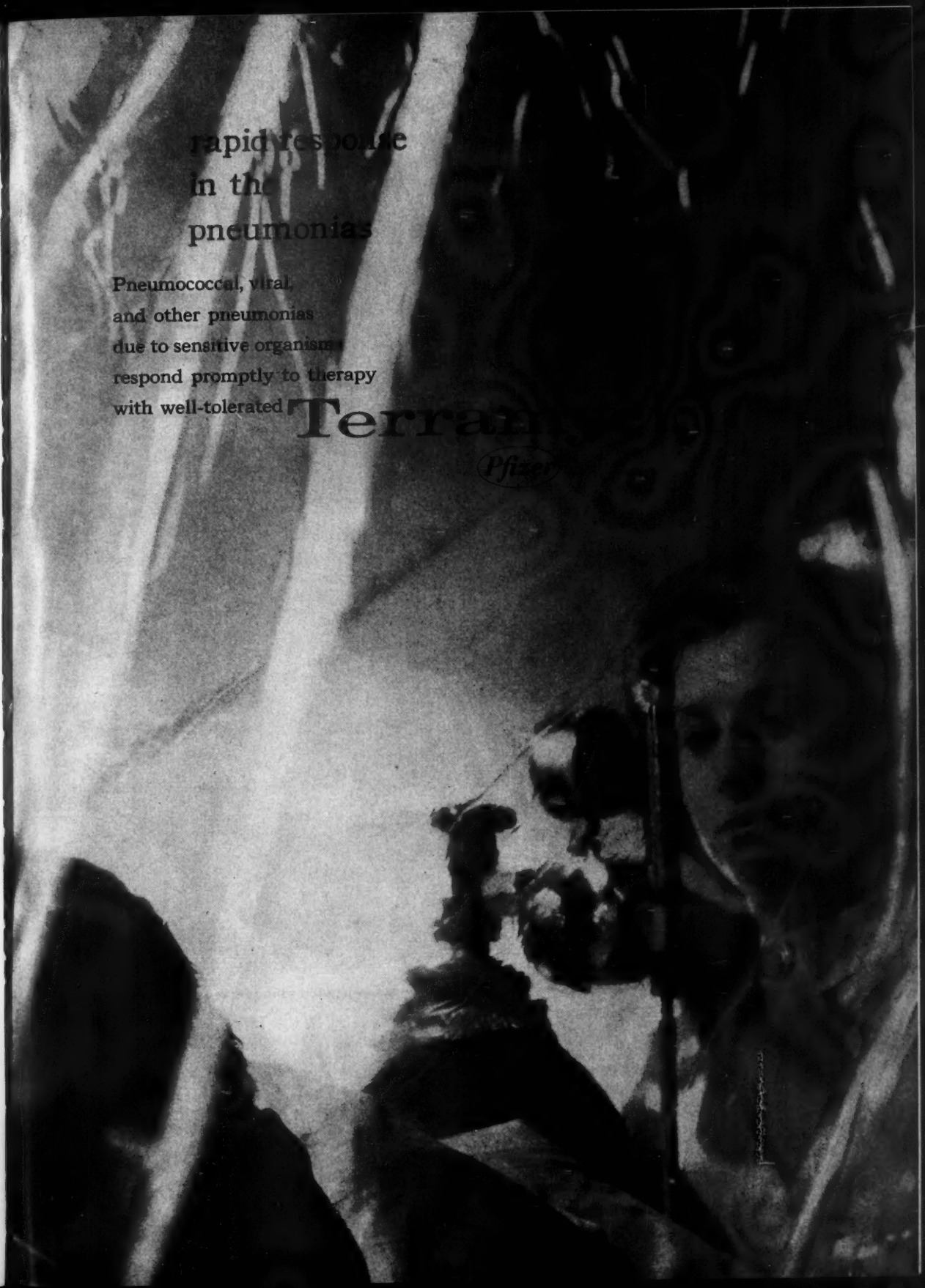
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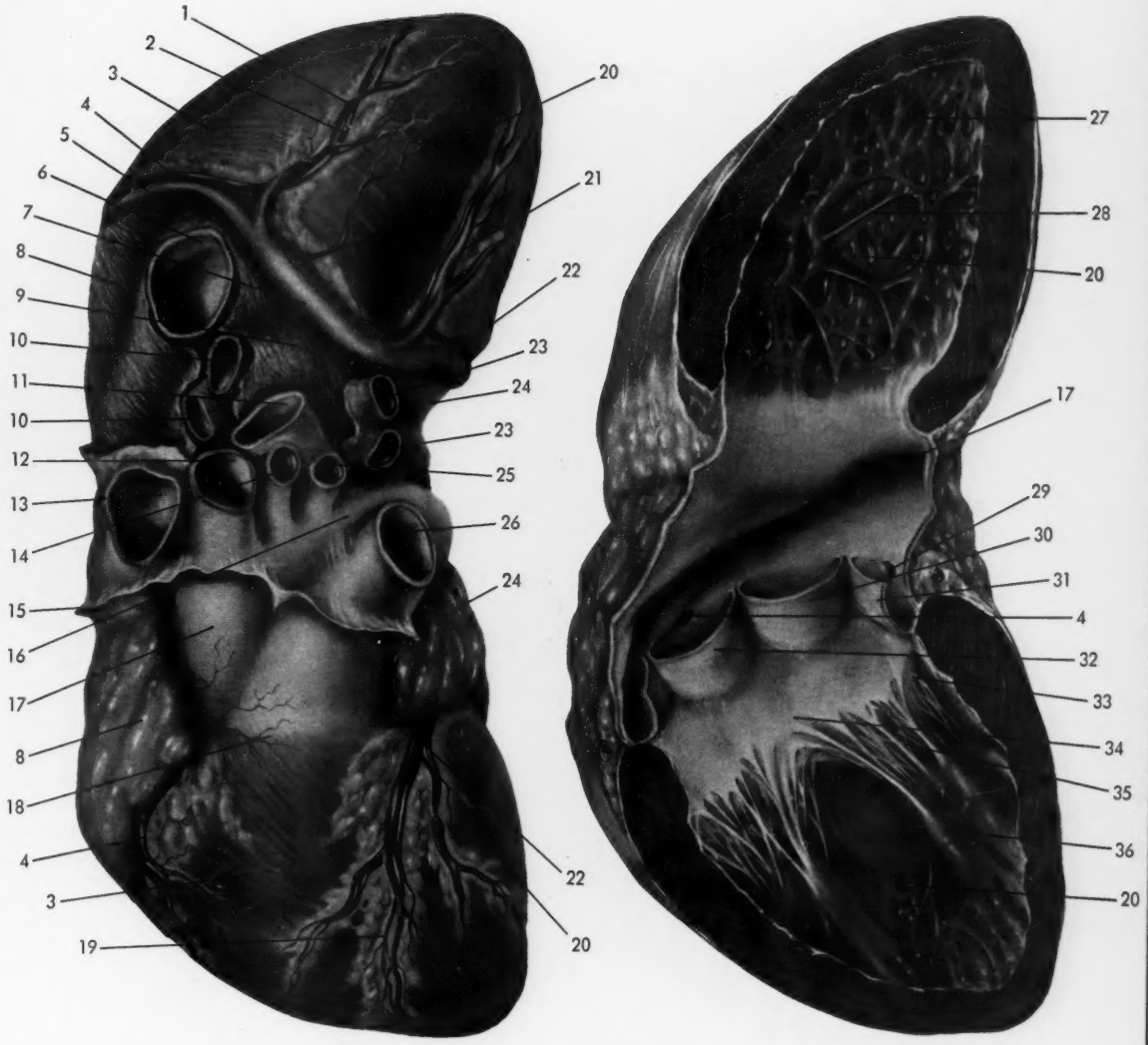

1 Middle cardiac vein
2 Posterior descending branch of right coronary artery
3 Right ventricle
4 Right coronary artery
5 Small cardiac vein
6 Inferior vena cava
7 Coronary sinus
8 Right auricle
9 Left atrium
10 Right pulmonary vein
11 Right branch of pulmonary artery
12 Innominate artery
13 Superior vena cava
14 Left common carotid artery
15 Pericardium
16 Aortic arch
17 Ascending aorta
18 Conus arteriosus
19 Anterior descending branch of left coronary artery
20 Left ventricle
21 Posterior vein of left ventricle
22 Great cardiac vein
23 Left pulmonary vein
24 Left auricle
25 Left subclavian artery
26 Left branch of pulmonary artery
27 Trabeculae carneae
28 Trabecula tendinea
29 Left coronary artery
30 Posterior semilunar valve
31 Left semilunar valve
32 Right semilunar valve
33 Posterior cusp of mitral (bicuspid) valve
34 Anterior cusp of mitral (bicuspid) valve
35 Chordae tendineae
36 Papillary muscle

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J. WILLIS HURST, M.D., Cardiologist, The Private Diagnostic Clinic, Emory University Hospital, Atlanta, Georgia.

LAWRENCE E. LAMB, LIEUTENANT, M.C., USAF; Cardiologist, Sheppard Air Force Base, Texas.

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CLYDE L. RANDALL, M.D., Professor of Obstetrics and Gynecology, University of Buffalo School of Medicine, Buffalo, N. Y.

ROBERT A. ROSS, M.D., Professor of Obstetrics and Gynecology, University of North Carolina School of Medicine, Chapel Hill.

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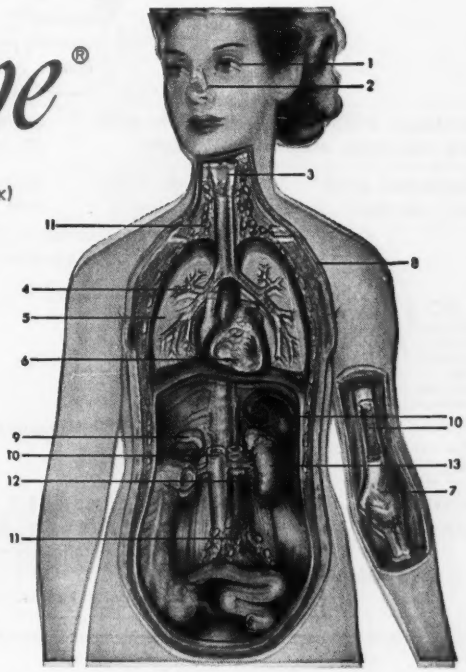

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4. Corynebacterium diphtheriae	Diphtheria carriers
5. Nonhemolytic streptococci	Some cases of endocarditis, genito-urinary tract infections

***References**

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THE JOURNAL
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Volume LIV JANUARY, 1953 No. 1

The Management of Terminal Patients with Inoperable Carcinoma*

John S. LaDue, M.D.
New York, New York

The care of the patient with terminal cancer is a poorly understood and challenging problem. The definition of terminal care should perhaps start from the time that the patient's disease cannot be managed surgically or effectively by any means of obliteration. At that time a plan should be made which will cover the expected life of the individual; it should be discussed with and understood by the family. I think that in the past too many of us have had an attitude of hopelessness, expressed like this: "The patient has cancer, there's nothing we can do for him anyway, so let's see that he gets all the morphine he needs and call it a day."

Fortunately, there is a great deal more that we can do for these patients. Most of them are not going to die tomorrow or the next day or the following week, or the following month. Unless we are aware of this problem and take on the responsibility, we will lose not only patients but also the good will of the families concerned.

Before accepting the responsibility of treating a patient with inoperable cancer, certain basic information is essential. The physician should be thoroughly familiar with past and present symptoms. It is no less important to know the physical findings at the onset and at the time of diagnosis of his disease, their progression and their change, than to know the extent of disease at the time terminal care is instituted. Too often patients are said to have carcinoma because of certain x-ray findings. They are given a prognosis, yet, as Dr. Churchill says, "The world is full of people who should have been dead six months ago." Without an accurate pathological diagnosis, it is impossible to plan an intelligent course of treatment since such diseases as Boeck's sarcoid, lupus erythematosus, and the like may be readily mistaken for carcinoma unless proof is available in pathological slides.

Too often carcinoma is deemed inoperable, and you are asked to care for a patient by the surgeon or another colleague. Don't take his word for it. Re-examine the problem; see if the patient is operable. Too often the family is told, "Well, he is 65 years of age, he has a bundle branch block, has cancer, and just won't ever survive surgery." Such is not the case, since more than 60 per cent of such patients have significant salvage rates following adequate surgery.

Then, too, patients may be abandoned at one exploratory laparotomy and the disease found resectable by other surgeons who are more experienced. I think that these facts should always be kept in mind before beginning the long last mile with the patient.

It is important to have a knowledge of the natural history of the type of cancer which the patient has. Patients with a lymphoma may live from a few months to as long as 20 years; patients with carcinoma of the thyroid have, by and large, slowly growing tumors and may live five, six, or more years. You will certainly give the family an incorrect appreciation of what to expect if you are not aware of the natural history of the type of cancer that you are dealing with.

In no field of medicine is environment and the patient's reaction to it more important. Keeping up the morale of the patient is certainly dependent upon the diagnosis as well as the prognosis. How much do you tell the patient? Do you tell him he has carcinoma, or not? As you know, the opinion is widely divided in this country with some people advocating telling the patient not only that he has a malignant disease, but outlining in detail what he can expect to happen to him. Another group feels that this information should not be divulged to the patient, except under extreme duress. I think this problem should be individualized. There are cer-

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tainly some individuals who would at least have to know that they have a malignant disease, but it is a heartless thing to give them a too definite idea of what to expect, or a hopelessly grave prognosis. The white lies one tells in managing these patients are as numerous as the tablets the patient has to take during the course of treatment.

By and large, it is not our custom to tell a patient that he has a malignant disease except in extraordinary instances, because we have found that the morale of these people disintegrates; they are depressed and despondent, and members of the family can't help but take on some of the coloring of the patient's reaction to this unhappy information. Although we may tell a patient that he has a tumor, we do not necessarily say that it is malignant. Hardly ever is it necessary to give a patient an accurate idea of what to expect from his disease.

Too little is known about the effect on the psyche of deforming surgery. Dr. Sutherland at Memorial has shown that patients who have had gastrectomies and colostomies may represent incredible psychotherapeutic problems simply as a result of the surgery itself. Families are heard to remark, "It would have been better if he had died of a gastric hemorrhage; all he does is sit around and cry." "He's not a man anymore" and the like. These situations can be avoided if the patient has an understanding of what procedure is going to be done when he goes to surgery. A woman should not awake or become aware two days postoperatively of the fact that she has a permanent colostomy and have to adjust to it at that time. Some preparation of the patient for this eventuality should be made.

The doctor-patient relationship is more important than generally realized by the doctor. To the patient it is all important. Too often the physician comes in and says, "Hello Jim, how are you? My, you look fine today."

The badly frightened patient says, "Well, I've got a pain."

The doctor says, before the patient can say any more, "Oh, that will pass. Here is a new prescription," and walks out.

You cannot keep the confidence of the patient by such techniques. It is important to take time to listen to his complaints, not only to listen to him, but to try to evaluate his symptoms and understand their source. At the same time, careful, periodic physical examinations must be done if you are to retain the confidence of the patient. Failing this, the patient will leave you and become a prey to the numerous quacks who invade the fringe of medicine with various types of cancer "cures" with which all of us are too familiar.

The patient with inoperable carcinoma should be kept out of bed and as active as possible for as long as possible. He should be encouraged to engage in any activity up to tolerance. Too often these patients remain in bed, partly because they are frightened, partly because of over-solicitiousness of their families, asking them every five minutes, "Is there anything I can get you," or "Are you comfortable" and then coming around and patting the pillow. I think that the family should be instructed to give the patient these attentions only on demand, and be told that if they become oversolicitous, the patient may react by becoming bedridden. Providing attention is paid to all of these matters, the reaction of the patient to his disease may be good. He will have a reasonably high morale. He will look forward with hope; he will express great interest in his various symptoms as well as his response to the administration of various therapeutic agents.

Supportive measures constitute one of the bulwarks in the management of the patient dying with inoperable cancer. Nutrition is an ever-present problem, and the patient should be instructed in amounts of various types of food that he must eat to maintain his health. Having such knowledge, the patient will even sometimes keep a record and prove to you that he had adequate nourishment that day. The diet should be supplemented with massive doses of vitamins and with iron, should anemia be a problem. At times, the fluid and electrolyte balance may require the administration of parenteral feedings and parenteral fluids, but these should be reserved until the need is great. Certainly I think the attempt at increased protein intake with some of the various concentrated foods sometimes does more harm than good. Many patients are nauseated by some of the protein or fat concentrates. It is more important to try to get the patient to think of food and choose the proper type. Let him have an exact understanding of what his nutritional needs are from day to day, and he will make a real effort to cooperate with you.

Unnecessary nursing may depress the patient's morale. He should be instructed in the care of his own colostomy, taught how to give his own irrigations, how to manage the irritation of the skin about a gastrostomy, ureteral cutaneous transplant, or tracheostomy. How many times have you personally, or have you seen friends of the family, come into a malodorous sick rom and be unable to mask their expression of distaste? Happily today we have chlorophyll derivatives which, sprayed liberally about the patient's room and dressings, minimize this distressing problem.

Control of constitutional complaints demands an understanding of their cause. Generalized malaise may be characterized by weakness, easy fatigability, anorexia and the like. Chills, fever, and sweats are usually due to infections somewhere, and an investi-

gation of the source of the infection is often fruitful with the temperature subsiding following the administration of specific antibiotics. Insomnia should be controlled by the use of sedatives, and/or morphine if pain is involved. Much of the generalized malaise may be due to unsuspected anemia, and the administration of transfusions at relatively frequent intervals may result in a prompt and remarkable improvement of the patient who is bedridden.

Obviously, the control of pain assumes prominence at one time or another in most patients who are in the terminal stages of their disease. There is no immediate need to hurry administration of powerful analgesics, but an attempt should be made to control pain with some of the coal tar derivatives such as aspirin and phenacetin. The use of pyramidon should not be forgotten, despite the slight risk of aplastic anemia attendant upon the giving of this medication. If ineffective alone, coal tar derivatives should be given with small amounts of codeine. If pain is still not controlled, resorting to opiates such as morphine, Dilaudid, Pantopon, and Demerol is indicated. Methadon and Dromoran are useful in that they do not depress the level of consciousness of the patient as much as the opiates. It is helpful to employ opiates at night, together with sedatives, so that the patient may obtain adequate rest, and methadon or Dromoran during the day. Metapon is simply mentioned to say that it has not proved particularly effective.

The administration of alcohol, either by mouth or intravenously, may provide relief from pain and sedation that is not easily obtained in other fashions. The administration of five per cent alcohol in 10 per cent glucose with protein hydrolysate solution at night not only gives nourishment but frequently allows the patient a good deal of rest.

In our hands, the use of procaine has been disappointing. When enough of a one per cent solution is given intravenously, the patient develops serious side effects consisting of marked restlessness, nervousness, and even convulsions, so that we have discontinued the use of this particular medication as an aid in the control of pain.

Neurosurgical procedures such as chordotomy and rhyzotomy may often give relief from unbearable pain but are not practical when the origin of the pain is below the level of D-6. Pre-frontal lobotomies and other types of brain surgery, although effective in pain relief, often result in such serious mental deterioration that they are rarely resorted to. Patients with pre-frontal lobotomy often say they feel pain but it no longer upsets them. Mental deterioration varies from behavior problems of serious magnitude to complete amentia.

X-ray therapy is one of the most effective specific measures of the control of pain. Before we discuss pain, we should first know the cause of it. Is the pain from the local tumor; is it from irritation; is it from a metastases of one of the bony structures; or is it due to pressure on one of the nerve roots? When pain is due to bone metastases, the administration of moderate amounts of x-ray therapy, in the neighborhood of 1000 r as a tumor dose, often permits a patient who was bedridden to get up and walk just as spryly as did Dr. Huggins' patients this morning, those who had had bilateral adrenalectomies. The detection of the location of bone metastases may be called to your attention by the patient himself, or by a physical examination, and is finally confirmed by x-ray. Do not deny these patients the use of palliative x-ray therapy for the control of pain. It provides one of the most effective measures available today.

There are specific measures for the treatment of inoperable cancer. These include the use of x-rays directed at metastatic lesions, which, by their very bulk, produce distressing symptoms such as extensive involvement of the mediastinum, for example, or massive enlargement of glands in one part of the body. Such tumors may, not uncommonly, respond to intelligent use of x-ray therapy.

The nitrogen mustards have considerable value, particularly in the management of the lymphomatous diseases, when x-ray therapy is no longer effective. They may promptly control the constitutional symptoms of these diseases, and, finally, nitrogen mustards have proved, in our experience, sometimes as effective in controlling effusions in peritoneal and pleural spaces as x-ray therapy. Twenty to 40 milligrams of nitrogen mustard are injected with 50 cc. of saline into the pleural space, or even into the abdominal cavity when ascites is present. This usually slows, or may rarely prevent, recurrence of effusions in these areas, particularly when the effusions are due to carcinoma of the breast. Such therapy may be repeated several times, providing the white blood count and platelet levels are not below 3,000 per cubic millimeter and 150,000 per cubic millimeter, respectively.

Nitrogen mustard is an effective and useful adjunct in the treatment of anaplastic carcinoma of the lung. Some individuals may respond dramatically to the administration of nitrogen mustard with disappearance of a superior caval syndrome, intractable cough or severe pain. Relief may be afforded for a period of weeks, to several months. Remember, this short time is extremely important to the patient who has cancer. His last few days are as precious to him as months or years of your own life, and if you throw up your hands because your patient has only a short time to live, he will not thank you for it.

The radioactive isotopes have been adequately discussed, and antifolic acid compounds should be

reserved for the treatment of acute leukemia, particularly in children. These are much less effective in adults, and must be given until the white blood count falls to a level of 2,000 or less, for best results. Urethane has proved useful in control of the pain of multiple-myeloma and may, indeed, cause a diminution in the number of plasma cells in the bone marrow. It is given in dosages of one to three grams over a period of two to three months.

Teropterin and placebos are spoken of synonymously because we consider teropterin essentially as a placebo. Placebos do have their place in the management of the patient dying with inoperable carcinoma. Sometimes the administration of any new drug will result in a prompt improvement in the patient and in his morale. Teropterin and other placebos are no exceptions. In a study of pain being done at Memorial Center, it has been noted that an injection of saline, no matter how serious the pain, may provide some relief, although the relief is of short duration. In susceptible individuals whose symptoms are magnified by anxiety and nervousness, significant amelioration of symptoms may be achieved with placebos—a probable reason for the popularity of various cancer cures and nostrums.

The use of estrogens, androgens and adrenalectomy has been discussed by Dr. Huggins and needs no further comment except to point out their efficacy in the management of carcinoma of the prostate and the breast.

Experiments are now being carried out to test the effectiveness of removal of the pituitary gland in the management of patients with inoperable cancer. Too few patients have been so treated to allow approximation of any possible efficacy of this procedure.

There is evidence that x-ray therapy can be dramatically effective in the treatment of inoperable carcinoma of the lung. Chart 1 shows that patients

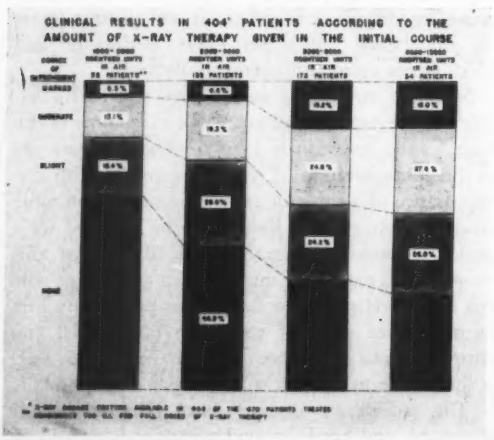

Chart 1

given 5000 to 8000 r have shown various degrees of improvement. Marked improvement is manifested by complete return to normal activity as seen in 15 per cent of these patients. Moderate improvement, meaning that the patient could engage in limited activity and was symptom free, was seen in another 25 per cent. Slight improvement, which means only symptomatic relief of pain, cough, hemoptysis and the like, was seen in another fourth of the patients. The remainder showed no improvement.

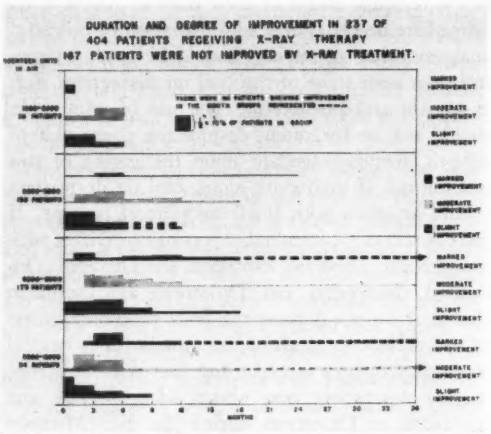
DURATION AND DEGREE OF IMPROVEMENT IN 237 OF 404 PATIENTS RECEIVING X-RAY THERAPY
167 PATIENTS WERE NOT IMPROVED BY X-RAY TREATMENT.

Chart 2

Chart 2 shows that this improvement may persist for a significant period of time. The improvement, whether it be marked, moderate or slight, lasts on the average for six months and may persist for much longer.

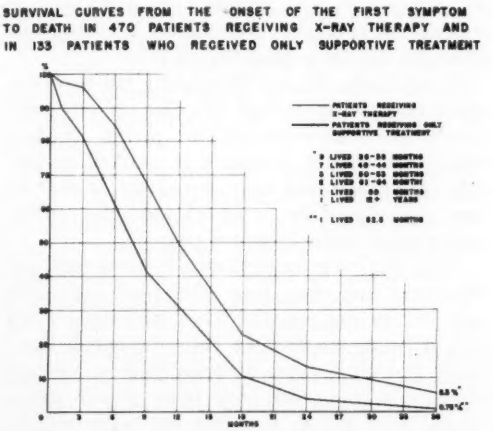
SURVIVAL CURVES FROM THE ONSET OF THE FIRST SYMPTOM TO DEATH IN 470 PATIENTS RECEIVING X-RAY THERAPY AND IN 133 PATIENTS WHO RECEIVED ONLY SUPPORTIVE TREATMENT

Chart 3

Chart 3 compares the survival rates of 470 patients receiving x-ray therapy with 133 who received supportive care only. There is a difference in the survival rates varying from 25 per cent at nine months to 10 per cent at two years. We have

had six patients who lived five years or longer who were treated with x-ray therapy; the longest control survival was 62½ months. One patient lived 12 years with proven squamous cell carcinoma of the lung, finally dying of heart disease. He was symptom-free and at full employment for 12 years, whereas prior to treatment he had cough, chest pain, and hemoptysis.

The use of ACTH and cortisone in the treatment of leukemia and acute leukemia has lengthened the survival of patients with this disease from a matter of a few weeks to several months. Complete remissions are seen in 15 to 30 per cent of the patients, clinical and hematological remission in 13 to 35 per cent, and clinical without hematological improvement in another 28 per cent. Complete failures occur in only 20 to 40 per cent of the patients with acute leukemia who are given ACTH or cortisone. These statistics are true for children but not for adults. Adults with acute leukemia respond poorly to any therapy.

There is no type of patient who will give a more varied experience than the patient presenting the multiple, sometimes bizarre and always interesting symptoms and physical findings exhibited by dying of inoperable cancer. If you treat four or five of these patients over a year's time, you will have a refresher course not only in internal medicine but in surgery, physical diagnosis, and in therapeusis because all of your skills are stretched to their utmost if these patients are to be kept comfortable. It does make a tremendous difference whether you treat these patients or ignore them.

Cardiac metastases may occur and give rise to symptoms. Forty-four per cent of patients dying of malignant melanoma have involvement of the heart muscle; 44 per cent of patients with leukemia and 24 per cent of those with lymphomas exhibit cardiac involvement. Other tumors involve the heart and pericardium to a much smaller degree. These patients may exhibit symptoms of cardiovascular disease that may respond to ordinary methods of management, but thus far we have not tried x-ray therapy as a means of treating them.

The respiratory system is a favorite repository for metastatic cells and may give rise to various respiratory symptoms by parenchymal or mediastinal involvement. Pleural effusions, when present, should be treated by frequent aspirations and/or the instillation of nitrogen mustard or radioactive gold. It is wise to give every patient with cancer who has a pleural effusion an opiate prior to doing the tap because, as you know, when fluid is withdrawn, severe cough and respiratory distress may develop which is decreased by the prior administration of opiates.

The gastrointestinal system is certainly the sounding board for the psychosomatic patient and no less so for the patient with cancer, who, besides having actual intra-abdominal diseases, has most intense psychosomatic problems. Dysphagia sometimes requires the administration of adequate x-ray therapy to control tumor pressure on the esophagus from without and may be followed by satisfying relief. Medical treatment may consist of the administration of antispasmodics, sedatives and a liquid diet. Sometimes the passage of a Kantor tube is desirable because it can be passed through the stomach and into the duodenum easily. Then feedings can be given without fear of regurgitation or aspiration pneumonia.

Nausea and vomiting may be due to the treatment that you give, to the opiates, to x-ray therapy, or to nitrogen mustard, so don't blame all the patient's symptoms blithely on the fact that he has cancer. Investigate, find their origin and cause, and then institute intelligent measures.

Diarrhea may be extremely distressing. We have found the use of tincture of opium to be an effective measure in the management of this complication. We ordinarily give 20 drops of tincture of opium before meals and at bed time, and after each loose stool, until the diarrhea is controlled. The giving of magnesium trisilicate or aluminum hydroxide is a useful adjunct as is also the institution of a low residue diet.

Intestinal obstruction may sometimes have to be treated surgically, particularly when the immediate prognosis for the patient is not too bad; otherwise, it may have to be managed by intubation and parenteral feedings to control the rather terrible symptoms of intestinal obstruction, that is, pain, nausea, and vomiting, extreme restlessness and the like. It is not fair to ignore these patients. "You have inoperable cancer, you are going to die anyway, it may as well be now" is not acceptable therapy. At least they should have a comfortable exodus, if possible.

The development of ascites is common, needing abdominal paracentesis. The intraperitoneal administration of radioactive gold and nitrogen mustard may delay the reformation of fluid and may, on occasion, prevent its recurrence.

Jaundice, when it appears, should be evaluated to see whether it is due to parenchymal disease such as follows the administration of a transfusion two or three months previously, or whether it is obstructive. When jaundice is obstructive in nature and complete, patients may not survive longer than seven to fourteen days unless treatment is instituted. On occasion, palliative surgery consisting of cholecystenterostomy and the like is certainly justified.

Gastrointestinal hemorrhage should be treated medically by supportive measures, by a regimen of

frequent feeding, supportive transfusions and sedation.

Patients with metastatic disease to the abdomen or to the spine may have distressing bladder symptoms. An individual may have to pass urine every 10 to 40 minutes, and sometimes the simple administration of bladder sedatives or antispasmodics may make him more comfortable. Many are more resistant and those who have urinary retention or incontinence should have a Foley catheter inserted immediately which may be left for weeks or months, providing it is changed and properly cared for and providing moderate amounts of antibiotics are given daily to control ascending pyelonephritis. The development of uremia and oliguria is sometimes susceptible to treatment, particularly when it is due to extrarenal loss of fluid such as is associated with intractable diarrhea, nausea and vomiting, and the like. Then the administration of indicated fluids and electrolytes (sodium, potassium, chloride, bicarbonate or glucose), may produce dramatic improvement in the patient who is critically ill, and he may then live for variable periods in relative comfort.

The importance of the treatment of metastases to bone has been mentioned. The spine is one of the most frequent sites of such metastases and may give rise to severe pain, paresthesias, or paralyses. Adequate x-ray therapy may frequently completely control these symptoms. When these neurological symptoms are present, don't just say, "Oh, the disease has spread. This sounds like curtains," etc.

I recall a patient eight years ago who had a paraplegia due to involvement of the spinal cord with Hodgkin's disease who, following adequate x-ray therapy, was able to carry on a normal life for eight years. If she had been abandoned, she would have been dead long ago. Neurological symptoms are not always due to bone involvement of the spine. Lymphomatous diseases are particularly notorious in this regard, with involvement of the nerve sheaths and pressure on the posterior roots. Intelligent administration of x-ray therapy over the involved areas of the spine and/or the use of nitrogen mustard or triethylene melamine will often result in prompt and dramatic relief.

Local lesions require considerable attention. Neglect of colostomies and gastrostomies will lead to painful ulceration of the skin, and one should have available proper dressings and perhaps use aluminum or soy bean paste to protect the skin from irritating discharges. Keeping the patient ambulatory helps to prevent the development of bed sores which are fairly common prior to death but can be kept at a minimum and controlled for a long period of time by intelligent care of the skin. Any patient who is incontinent should have an inlying catheter, or tidal drainage should be instituted. Otherwise they are constantly in a wet bed and almost routinely develop uncontrollable bed sores, are intractable nursing problems and quickly become demoralized. Cystitis and ascending infection can be modified by proper catheter care and by giving antibiotics.

Development of intractable pruritus is seen most frequently in the lymphomatous diseases. It may respond dramatically to the administration of nitrogen mustard or triethylene melamine. When these fail, ACTH or cortisone are often effective; ACTH or cortisone may, as you know, help the mental attitude of the patient, and improve his appetite. Both these hormones may cause euphoria, depression, or psychoses. In patients with severe anemia associated with cancer who require frequent transfusions, the administration of ACTH or cortisone may decrease this need. This is corroborated by renewed activity of depressed bone marrow, so it is not just a general effect but specific. Patients with acquired hemolytic anemia and thrombocytopenia react favorably to these hormones. Also, the administration of ACTH, 10 to 20 mgs. intramuscularly every four hours, may decrease or even obviate the need of opiates for the control of pain. When intractable pain becomes a serious problem and surgical measures are under consideration for control of pain in debilitated patients, ACTH should be given a trial in conjunction with opiates. Obviously, one must be aware of the possible unfortunate side effects of the steroids.

In this necessarily short review I have endeavored to prove to you that the terminal care of the patient with inoperable cancer represents a challenge to all of us. These patients exhibit the most complex symptoms and physical findings, and their management demands a wide knowledge of drugs, surgery and radiation therapy. Meticulous care of these patients will allow them to live comfortably for a relatively long period of time, but indifference will result in a premature, often painful, and distressing exodus. Unless we take this responsibility, individuals on the fringe of medicine will take over and treat with various nostrums which will be guaranteed to cure cancer, solely because of indifference, lassitude and an unhealthy attitude of frustration on the part of qualified physicians.

Treatment of Thyroid Carcinoma with Radioactive Iodine*

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Treatment of thyroid carcinoma with radioactive iodine has been important, not so much because of benefit to any considerable number of patients, but rather because of the information this isotope has yielded about the biology of thyroid carcinoma. Radioiodine treatment of this tumor has excited both physicians and lay people with the hope, perhaps never to be fulfilled, that it was the first in a series of new treatments to be based upon metabolic localization of an isotope and the resulting internal radiation. Such radiation delivered from within the mass of malignant cells has great advantages, of course. Theoretically it can be limited to the neoplastic tissue with relatively little damage to surrounding normal tissue. Thus, the relative sensitivity of the tumor becomes less important.

Our own experience with radioiodine treatment of thyroid carcinoma is much less extensive than that in several other clinics. The information presented here is largely drawn from the reports of Chapman, Dobyns, Rawson, Seidlin, Trunnell and others.

Types of Tumor and Their Suitability for Treatment

There has been considerable difference of opinion and misunderstanding over the relationship of the histology of thyroid tumors to their treatability with radioiodine. It is now quite generally agreed that there is a great deal of correlation between histologic type and response to treatment. However, there are individual cases which fail to fit into the expected pattern, and there is sometimes pronounced variation in the histologic type within any one patient. Therefore, while it is possible to make general statements about the iodine concentrating ability of certain histologic groups, it is impossible to predict with certainty whether or not a given patient will receive benefit from treatment until the treatment is tried. It is also true that even a tumor which shows a distinct tendency to take up iodine may not do so to a sufficient degree to allow satisfactory therapy.

Well differentiated, alveolar tumors containing colloid, usually show a pronounced tendency to localize the iodine selectively. It seems likely that almost all tumors of this histologic type can be induced to pick up significant amounts of the isotope. Papillary tumors, which make up a large portion of thyroid neoplasms, are quite variable in type. Some of them show areas of alveolar structure with colloid, while others are quite undifferentiated. Their tendency to take up iodine is variable but appears to be correlated with the degree of differentiation and the amount of colloid present. Spindle cell, giant cell, and Hürthle cell carcinomas of the thyroid almost invariably fail to collect any significant amount of radioiodine.

Methods of Studying Iodine Uptake

In considering treatment of thyroid carcinomas with radioiodine, it is essential to utilize suitable methods of determining the localization of the radioactive material given. It seems to us impossible to treat these patients adequately on the basis of clinical response alone. In general, it may be said that when a dose of radioactive iodine is given to any patient, about 90 per cent of it can be accounted for if one adds the amount in normal thyroid and functioning carcinoma to the amount excreted in the urine. The excretion is inversely related to the amount of functioning thyroid tissue or thyroid tumor, and radioassay of urine excretion is of great value. However, to determine whether the retained iodine is in normal thyroid tissue or in tumor, unless we know that the thyroid has already been removed, we must make external counting studies over the thyroid and over the tumor and attempt to estimate the amount of radioactivity in each. We know that in general normal thyroid tissue has more avidity for radioiodine than does tumor, and if normal thyroid is present we can predict that the majority of the retained iodine will usually be in this tissue. After total thyroidectomy has been accomplished, if the patient fails to excrete the greater part of the administered dose in the urine, it is quite certain that most of that retained is in the thyroid tumor.

Methods of Influencing Uptake of Radioiodine

The most important measure that the physician can use in inducing or increasing the extent of localization of iodine in the tumor is the removal of the normal thyroid tissue. This is believed to increase the uptake in the tumor by two mechanisms. First, there is removal of the competition of the normal thyroid for the available iodine. Second, there is believed to be, as a result of decreased thyroid function, a stimulation of the pituitary to produce more thyroid stimulating hormone, which acts upon the tumor to increase its functional activity. It is generally believed that surgical resec-

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tion is the preferable method of eliminating any residual normal thyroid tissue. This has the advantage that it is more rapid than destruction of the thyroid with radioiodine and that it saves the patient from some preliminary radiation damage to normal tissues which might limit later iodine therapy of the tumor.

In patients who have had multiple operations and in whom scarring of the neck is a serious problem, it is sometimes preferable to do radiation thyroidectomy as the first step in treatment. In these cases it is perhaps somewhat arbitrary to imply that there is something special about the radioiodine given for thyroidectomizing purposes, since this is the inevitable effect of large doses of iodine, whatever the intention of the therapist. The presence of normal thyroid tissue does make a real difference, however, in planning treatment. We generally do not give doses larger than 60 mc. at a time for thyroidectomy, while after the normal thyroid is removed it may be advisable to give doses up to 200 mc. Whether thyroidectomy is done by surgery or radiation, it is important to check on its completeness by giving later tracer doses and determining the localization in the region of the thyroid.

All other methods used to enhance the uptake of radioiodine assume that a previous thyroidectomy has been done. One of these is the administration of thyroid stimulating hormone. This material has not been available in large amounts, and most investigators have been forced to rely upon the body's own thyroid stimulating activity. It has been shown, however, that this hormone can increase the tendency of certain thyroid tumors to take up radioiodine, and in the future it may be of some value.

The most important drug used to increase the uptake of radioiodine has been thiouracil, which has been used in rather large doses of from one to two grams per day. The exact action of this material remains somewhat obscure. Even in the presence of normal thyroid tissue, it sometimes appears to cause a change in the distribution of radioiodine with relatively more going to the tumor. It is used chiefly, however, in thyroidectomized patients, and here it is generally given for long periods of time and then stopped about two days before the therapeutic dose of iodine. Several mechanisms of action have been suggested. It may deplete the thyroid tumor of iodine so that it is more avid for this element once the block is removed. It may also augment the local action of thyroid stimulating hormone in some way; or, by increasing the severity of the body's deficiency of thyroxin, it may further stimulate the pituitary to produce this hormone. Whatever its mechanism of action may be, it is clear that thiouracil can be used to increase the amount of radioiodine which will be retained in the body and taken up by malignant thyroid tumors.

It is important to mention at this point the avoidance of certain factors which may decrease the successful localization of iodine in the tumor. The patient being considered for treatment with radioiodine should not be given stable iodine in any medication. The most common oversight is the use of iodine-containing opaque dyes for radiographic studies. When large amounts of stable iodine are introduced into the body, they may saturate the tissue to such an extent that radioiodine retention is blocked. This effect should not lead to confusion with the fact that tracer doses and therapeutic doses of radioiodine usually show about the same per cent retention and localization in any given patient. In this case even a large therapeutic dose of radioiodine contains so few iodine atoms that it is not in any sense a saturating dose of the element for the body.

Another way in which the treatment of a patient may impair iodine localization is in the use of radiation, either x-ray therapy or previous doses of radioiodine. This has led us to believe that external radiation should not be used until attempts at iodine therapy have been exhausted. Furthermore, it has made us feel that only tracer doses of radioiodine should be given until conditions are optimal for therapy; then a very large initial dose of radioiodine is administered, rather than multiple small doses which might impair the localization before they had done serious damage to the tumor.

Undesirable Effects of Radioiodine Therapy

Both local and general undesirable effects may be produced. There may be an initial inflammatory reaction when a large amount of radioiodine is localized in a tumor. This occurs even in more pronounced degree when iodine is being used to remove normal thyroid tissue. This reaction usually develops at about 24 to 48 hours after the dose is given, and may consist of pain, swelling and erythema at site of localization. Occasionally, when a lesion is located at a vital point, serious symptoms may result. One of our patients required a tracheotomy immediately after the first large dose of iodine. A second effect may consist of a transient episode resembling thyroid crisis which is apparently associated with increased blood thyroxin produced as a result of break down of the tumor.

More serious damaging effects of the iodine are those related to total body radiation. Even in cases where the iodine localizes well, there may be considerable total body radiation both from the gamma rays spreading out from the tumor and also from the more uniformly distributed radiation resulting from radioiodine in the blood. Rawson has emphasized the importance of the blood radioiodine level and believes that, on the basis of previous

tracer doses, and blood radioactivity determinations, the radiation of the blood should be calculated in advance and kept below 500 equivalent roentgens. The most important manifestation of total body radiation damage has been bone marrow damage with transient or even permanent and severe depression of the levels of red cells, white cells and platelets. As in other forms of radiation injury, an initial lymphopenia is the most sensitive hematologic change.

Damage to other tissues has not been prominent. A few patients have shown amenorrhea, but it is doubtful that this can be attributed to radiation damage to the ovaries. The question of future genetic effects from these large doses of radioiodine is a difficult one to answer. With our present small success in therapy, there certainly will not be a very large number of patients who have undergone this form of treatment and will later have children. There is also the possibility, of course, of late radiation effects in the patients themselves, such as an increased incidence of leukemia, or production of carcinoma at the site of previous iodine uptake. It is too early to know how important this will be.

Another possible undesirable effect of treatment is to be considered. By removing the normal thyroid tissue, we may cause production of more thyroid stimulating hormone, which in turn may increase the rate of growth of the tumor. If we are then unsuccessful in treating the tumor with radioiodine, we may have done more harm than good. Therefore, it seems desirable not to undertake treatment of the tumor with radioiodine unless it is to be followed up vigorously, and if it becomes apparent that the treatment is unsuccessful, adequate replacement therapy for the myxedema should be given.

Myxedema, of course, is an inevitable complication in all patients who are treated over a considerable period of time. In some instances the tumor itself may be sufficiently functional to prevent the appearance of clinical signs and symptoms. However, we do not believe that the presence of myxedema in itself proves that the tumor is so non-functional that therapy should not be tried.

Plan of Therapy

It may be worthwhile to review briefly some of the considerations in deciding upon treatment of a patient with radioiodine. We believe, first of all, that every patient with thyroid carcinoma should have adequate surgical treatment and that the advent of radioiodine has not supplanted surgery. If anything, it has emphasized the need for adequate and sufficiently radical surgical treatment. It is certainly a great mistake to assume that a less adequate surgical approach is needed because of the possibility of later radioiodine treatment, when we consider that the great majority of thyroid carcinomas cannot be treated successfully with radioiodine.

We accept for treatment only patients who have distant metastases or local extensions of carcinoma which cannot be treated surgically.

The first step in treatment, as has been mentioned before, is completion of a thyroidectomy if this has not already been done. After thyroidectomy, either by surgery or radiation, we check on the completeness of the procedure by means of repeated tracer doses of radioiodine. These are often started within two weeks of the surgical operation, but must be delayed longer after radiation thyroidectomy. These tracer doses help us to determine whether the tumor is showing any tendency to take up iodine. In cases where all of the tumor is adjacent to the normal thyroid and where a radiation thyroidectomy is done, it may be difficult to determine when the normal thyroid is no longer functioning.

As soon as we believe that the tracer doses are indicating a considerable retention of radioiodine in the tumor, we give a therapeutic dose. On the other hand, if there is no significant localization of the iodine in the tumor several weeks after thyroidectomy, thiouracil therapy is started. Again repeated tracer studies are done, the iodine being given two days after the thiouracil is stopped each time. Urinary assays and external counting studies are performed to determine the retention and localization of the iodine. Whenever it is believed that the tumor is retaining a considerable amount of iodine, a large therapeutic dose is given, often of 100 to 200 mc. It is true that the blood level of radiation predicted on the basis of tracer studies may be helpful in determining a safe dose. Following the therapeutic dose, we again give tracer doses after six to eight weeks, and if there is further deposition in the tumor the therapeutic dose is repeated, providing there is not too much evidence of bone marrow damage.

It is extremely difficult to know when to give up the attempt to treat patients who fail to show localization of the iodine. Often their symptoms related to neoplasm are complicated by the severe induced myxedema, and one feels that the attempted therapy has only added to their discomfort. We do not believe that any arbitrary statement can be made about the number of tracer doses or the period of observation which should be insisted upon. We would be inclined to make a more prolonged effort in patients whose tumors were histologically relatively more differentiated. In patients with undifferentiated tumors who have never shown any sign of uptake of iodine, it seems fruitless to make further attempts if there has been no success six months after thyroidectomy. I believe that within

a few years, unless better means are devised for inducing uptake of the iodine, we will be rejecting patients with undifferentiated tumors at the outset, without attempting therapy.

In patients who respond well to treatment, after the tumor seems completely quiescent and there is no more localization of radioiodine, the myxedema is treated, of course, for the patient's comfort. The eventual outcome in these patients is unknown. Dr. Seidlin's initial patient apparently had complete destruction of the thyroid tumor, and one almost feels tempted to use the word cure in describing this patient. However, in the great majority of patients, it appears that even a favorable response is only temporary and that there will be recurrence.

Certain Controversial Problems

We are sometimes asked whether or not it is worthwhile to give a tracer dose of radioiodine to all patients who are to be subjected to thyroidectomy for a lesion believed to be thyroid carcinoma. We feel that this is a desirable procedure, since even in the presence of normal thyroid it may be possible to get some idea of the iodine retaining capacity of the thyroid carcinoma. If this is to be done, both autoradiographic and radioassay studies are helpful in addition to the usual histologic studies.

A second question is whether a total or a hemithyroidectomy should be done for a well localized malignant lesion in one lobe of the thyroid. There may be two reasons for doing a total thyroidectomy. First, it may improve the chances of surgical cure by removing a tissue which may have been invaded microscopically by the tumor. Second, it may prepare the patient for later radioiodine therapy if surgical treatment of the tumor is not successful. The disadvantage of total thyroidectomy is, of course, that the patient will have permanent myxedema, and there is a greater possibility of the surgical complications of thyroidectomy. We favor total thyroidectomy, along with whatever lymph node dissection may be indicated, not so much because of the possibility of later iodine treatment as because of the possible improvement in surgical curability statistics.

Another question which has been asked is whether it would be desirable to give prophylactic therapeutic doses of radioiodine to patients who have had apparent complete removal of tumor but who may have early, non-detectable metastases. Our impression at the present time is that there is not sufficient justification for giving radioiodine treatment when the presence of the lesion to be treated is uncertain and when there is no method of determining the effectiveness of treatment. We would therefore wait until some distinct lesion had developed before undertaking therapy.

Still another question is whether there is any great advantage in detecting metastases at an extremely early point, and whether radioiodine as a means of finding metastases (on the basis of external radiation counting), has any advantage over routine x-ray studies and physical examination. We feel that when the ability of the tumor to take up iodine is unknown, one should rely primarily on the older methods. If the patient is known to have had a tumor of highly functional type, then it may be worth while to give rather frequent tracer doses and to do external counting surveys in hopes of finding early metastases. Theoretically, an extremely small metastases of less than one mm. in diameter might be less suitable for radioiodine treatment than a larger one where the cross firing effect of the iodine in multiple cells would be more pronounced.

Summary

In general it appears that not more than 10 or 15 per cent of patients with thyroid tumors can be greatly helped with radioiodine at present. These figures, which are somewhat disappointing, are offset by the fact that a great deal of new and valuable information about thyroid carcinoma has been forthcoming and there are further possibilities of improving therapeutic results.

Repeated Infections of Gonorrhea

Robert Boese, A.B.*

Kansas City, Kansas

A survey of the records of persons treated for gonorrhea at the Kansas City-Wyandotte County Health Department has revealed interesting facts about the proportion of persons who become reinfected with gonorrhea. The study includes all patients treated at this clinic from January 1, 1950, to September 30, 1952. Treatment received here before 1950 was included if the patient reported during this interval. Although some of the patients were treated before the use of penicillin became routine, each case is considered to be a separate infection, either because of a time lapse of several months or because of negative smears and cultures between infections.

The patients treated at this clinic are perhaps of a special class. They are those who do not consult

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a private physician for one reason or another, and as a rule they are not highly educated. It is believed that sexual contact is on a more "free and easy" basis among these than in other strata of society.

During this three-year period 936 persons were treated for gonorrhea. Of these, 669 (71 per cent) were males, and 267 (29 per cent) were females; 779 (83 per cent) were colored and 157 (17 per cent) were white. The white group had a much larger proportion of persons treated for only one infection than did the colored group.

In the white group, a large percentage of the patients were treated not more than twice, and the percentage of those having multiple reinfections falls rapidly. In the colored group, the number of patients having multiple reinfections shows a more gradual decline.

Males were reinfected a greater number of times than females. The greatest number of infections for males was 13 times in two colored patients. There were no white patients infected more than six times. One colored female was reinfected seven times. Three white females were treated twice. All the rest were treated only once.

The tables below show the number of cases and the incidence of repeaters for treatment of gonorrhea.

While it is common knowledge that many persons have gonorrhea more than once, it is interesting to observe that a majority at this clinic have the disease only once.

Colored Cases — 779

Times Infected	Number of Cases	Per Cent of Total Cases	Per Cent of Those Having More Than One Infection
1	450	58.0	.....
2	150	19.0	46.0
3	75	9.6	23.0
4	37	4.8	11.0
5	39	1.7	4.0
6	13	1.7	4.0
7 or more	15	1.9	4.6

White Cases — 157

Times Infected	Number of Cases	Per Cent of Total Cases	Per Cent of Those Having More Than One Infection
1	128	82.00	.....
2	21	13.00	72.0
3	4	2.50	14.0
4	2	1.30	6.9
5	1	.64	3.4
6	1	.64	3.4

All Cases — 936

Times Infected	Number of Cases	Per Cent of Total Cases	Per Cent of Those Having More Than One Infection
1	577	62.0	.....
2	171	18.0	48.0
3	79	8.4	22.0
4	39	4.1	11.0
5	40	4.2	11.0
6	15	1.6	4.2
7 or more	15	1.6	4.2

Male Cases — 669

Times Infected	Number of Cases	Per Cent of Total Cases	Per Cent of Those Having More Than One Infection
1	386	58.0	.....
2	127	19.0	45.0
3	67	10.0	24.0
4	35	5.2	12.0
5	28	4.2	9.9
6	12	1.8	4.2
7 or more	14	2.1	4.9

Female Cases — 267

Times Infected	Number of Cases	Per Cent of Total Cases	Per Cent of Those Having More Than One Infection
1	191	72.00	.....
2	45	16.00	59.0
3	12	4.40	16.0
4	4	1.50	5.3
5	12	4.40	16.0
6	2	.75	2.6
7	1	.38	1.3

PRESIDENT'S PAGE

Dear Doctor:

This is another year—1953. A new year brings with it a new challenge, and another chance. While the medical profession needs to make no apology for its record of the past, still the thought often presents itself—have we done all that we might and have we lived up to our responsibilities to the fullest measure of which we are capable? The answer naturally is difficult.

If the answer is in the negative, it is not so because of the lack of problems which confront us, but rather that many of us have not been sufficiently interested, or may have lacked inspiration or the proper leadership to have prompted us to our best efforts.

We have many problems to be solved during the coming year. Their solution will challenge the best efforts of all of us. May we have your counsel, help and cooperation in the months that lie ahead to the end that the year 1953 may be one of accomplishment, satisfaction and continued progress for medicine in Kansas.

Sincerely,

EDITORIAL COMMENT

Mid-Winter A.M.A. Session at Denver

The mid-winter meeting of the A.M.A. was held early in December, 1952, in Denver. The sessions were well attended and as usual filled with sectional meetings, televised operations and ample exhibits, both commercial and scientific. The only drawback, if indeed it was such, because the weather was splendid, was the fact that the auditorium was a considerable distance from the hotel area. At its conclusion the consensus was that the meeting was very worth while and had been enjoyed by those who attended.

Of interest here is a synopsis of action taken by the House of Delegates. This body always considers many subjects, and this meeting was no exception. By way of example, it endorsed the creation of a Department of Health and did not specify that its director be a physician. It opposed the use of prisoners for medical experimentation, granting them parole in return for such work. It made no further progress in their previously proposed meeting with the American Osteopathic Association. It accepted the report of the Committee on Medical Education revising standards for internship training, in spite of the fact that many persons felt this would result in reduction of the total number of internships available. It also voted to recommend that the United States withdraw from the International Labor Organization. This created a brief flurry of discussion in which some felt that such action would lose the United States the advantage of listening to the debates, but finally the recommendation was prepared and passed.

The session will be remembered, however, because of two principal items of business, the first of which concerns the doctor draft law. The resolution is not available in its final wording, but from notes taken at the time of the meeting it is recalled that the House voted in favor of renewing the doctor draft law and to include in the new law the $100 bonus. There were numerous other ideas and suggestions designed toward making this law more equitable, but of more importance probably was the recommendation that uniformed personnel should not be utilized to care for dependents of service men. It was strongly urged that the law contain a section declaring this to be the responsibility of civilian physicians in whatever community service men might be found. The other items are incidental, covering such matters as conservation of physicians, trying to find a system whereby the various services would not need to vie with each other, and an equitable point system. As stated above, the drama arose from the suggestion that dependents of service men not be cared for by medical officers.

The second major item of business was only tentatively determined, but concerns the Veterans Administration and, more specifically, the availability of facilities in veterans' hospitals for the care of non-service-connected conditions. The problem will require much more study and effort before anything tangible is arrived at, but in short the House of Delegates voted to place the A.M.A. in favor of legislation that would limit the use of Veterans Administration hospitals to patients with service-connected disabilities, except that mental and tuberculous patients could be cared for on a non-service-connected basis if they were unable to obtain care outside. Undoubtedly, further discussions on this subject will arise at the June meeting, which, incidentally, will begin on June 1, 1953. But in the meantime, the above is a brief summary of the present position of the A.M.A. with regard to important medical matters.

Rehabilitation of the Handicapped

In a recent edition of the *Current Medical Digest,* Howard A. Rusk, M.D., wrote on rehabilitation. From this article a summary is presented.

There are many problems to be faced with the increasing longevity of our population. These problems concern the nation as a whole as effects are felt on our entire economic program. During the first half of the 20th century, man's life expectancy has risen more than 18 years. An interesting comparison is the life span of 67.2 years in 1950, contrasted to prehistoric life span of 18 years. Ancient Romans advanced this expectancy to 25 years. In 1900, the aid of medical science, increase in medical services, and the rise in standard of living brought the life expectancy to just under 50 years. All of these things continued with the advancement in control of disease, and public health services increased this figure to the life expectancy noted above.

Continual study and research have proved that the greater the increase in life span, or as the population continues living to an older age, the greater the percentage of chronic disease and disability will be. Piersol and Bortz summarized the importance of this problem by saying, "The society which fosters research to save human life cannot escape responsibility for the life thus extended. It is for science not only to add years to life, but, more important, to add life to years."

Medical science is continuing its untiring efforts to find specific answers to many crippling diseases. Many have been found. It is important now, how-

ever, to utilize the many methods of rehabilitation available for those with physical handicaps and to teach these individuals to live at least within the full extent of their capacities.

The two great wars changed the attitude of the public toward a crippled or disabled person. No longer is a person listed as either fit or unfit for work. The early 20th century concept of anatomical perfection has been, in part, done away with by the physiological and functional concept and the subdivision of jobs for which the disabled may well be qualified.

It is vitally important to try constantly to improve our rehabilitation centers and to expand them to a point where centers of this kind will be more readily available for the many who do not yet have the opportunity to take full advantage of their services. In order to do this, everyone, the doctor, therapist, nurse, psychologist, employer, and disabled, must be willing to cooperate.

Neither personnel nor funds are available to build as many centers as are needed, but continual striving and cooperation from all will help bring about the unity needed to more adequately help the physically disabled.

The program of rehabilitation must be started in our hospitals with basic techniques and further references for help suggested. The responsibility of the physician cannot end when the patient or his illness has been cared for. Medical care ends only when the patient has been helped and guided to work and live with whatever his capacity might be.

The AMA Washington Office

Frank E. Wilson, M.D., has replaced Joseph Lawrence, M.D., as director of the AMA Washington office. During a recent meeting in Omaha he explained to representatives of midwestern states the activities of this office, outlined the work of the 82nd Congress and presented a picture of problems to be faced by the 83rd Congress which is currently in session. From a very simple beginning the AMA Washington office has now expanded to include a total of 17 persons. Dr. Wilson and one other member of the staff are registered lobbyists but, except for a very small portion, their work is almost entirely directed toward the assembling and distribution of information. This goes two ways—both in and out—for the benefit of members of the Congress as well as the medical profession.

During the last session of the Congress some 14,000 bills and resolutions were introduced. Although only a small percentage of this total dealt with subjects of interest to medicine, even that number was so large that no member of the Congress could devote the time necessary to become informed on all such legislation. Therefore, the Washington office provided its service in that field.

Among the medical bills considered by the last Congress, the following were of particular interest. HR 7800 passed and has become law. This bill rather generally revised the social security program. Section 3 offers a new type of health care benefit for a category known as the permanent and totally disabled. It states that the Federal Security Administrator shall adopt whatever regulations he believes necessary for defining eligibility within this category and determining the benefits in free medical and hospital care that may be obtained and for directing standards under which medical and hospital care may be administered. It is of interest that this section of the law expires on June 30, 1953, and that the benefits will not go into effect until July 1, 1953. Therefore, some future action of one type or another may be expected in this category.

Among the items to be considered by the present Congress is the physician draft law which will expire on June 30, 1953. Much effort is currently being given toward consideration of a more equitable procedure, but the issue remains in doubt. The AMA is attempting to retain the $100 bonus. The Defense Department wants the age limit lowered to 45, but expects to revise the law so that Group IV physicians with relatively few months of active service may be called together with Group III. There will be further efforts to pass a law comparable to the E.M.I.C. program of the last war. Health benefits for dependents of veterans is certain to receive attention, as will federal aid to medical education and federal aid for local public health units.

The AMA is interested in the Reed-Keogh bill which was not acted upon in the last session. A brief analysis of this bill which has been more completely described in the Journal of the AMA would be to state that it presents for physicians and certain other persons a pension plan. Under this bill a doctor could set aside during his years of maximum income amounts not over 10 per cent of his gross income or $75,000, whichever is the smaller, and have that exempted from current income. After the age of 65 he would draw monthly benefits from this investment and pay income tax on the withdrawal at the time it is used. Since this affects other than physicians, attorneys, farmers, actors, musicians and many groups are uniting their efforts for passage of the Reed-Keogh bill.

Also of great interest to the medical profession is the I.L.O. Although previously discussed in the Journal, it might be repeated that this International Labor Organization was formed at about the time of the League of Nations. When the United Nations was established, a means was provided for attaching

the I.L.O., although somewhat loosely, to the United Nations. There are today 65 nations, including the United States, participating in the I.L.O. At its annual congress each nation is entitled to send four official delegates: two representing government, one representing labor and one management. Each nation, however, is entitled to only one vote. Decisions of this Congress are referred back to member nations, and in the case of the United States require a two-thirds vote of the members present in the Senate for ratification. The rest of this story and how socialized medicine can be brought in by way of the back door has been previously discussed.

This procedure spoken of as treaty law is a dangerous possibility, not only because of medical implications but for all phases of American life. It by-passes the normal democratic legislative processes that have existed throughout the previous history of the United States.

In spite of the publicity given recent actions by the I.L.O. there are many other examples of potential treaty law that can be equally disturbing. Dr. Wilson advised that there are now about 20 such treaties that can be brought before the Congress of the United States for ratification whenever the President wishes to do so. If two-thirds of the members present vote in the affirmative, it represents commitment by the United States. One such treaty, although almost completely unheralded, is already in effect. It relates to an agreement between Italy and the United States and is called the Treaty of Friendship, Commerce and Navigation of 1948. Buried in an innocuous, friendly document is a statement that any Italian physician who wishes to practice medicine in the United States must be permitted to do so on a comparable basis as though he were a citizen of the United States.

The above is mentioned only to serve as an illustration of what can happen under treaty law. This situation probably never will create an emergency, but it is not impossible that some far reaching program could be enacted without public knowledge if this type of process is permitted to continue. Senator Bricker plans to introduce a bill to this session of the Congress which will set up processes for writing into the constitution of the United States a provision prohibiting the United States from committing itself to any nation for any purpose on a basis of treaty agreements unless acted upon according to the American concept of democratic legislative processes.

A series of pamphlets dealing with the problems of physical medicine and rehabilitation in multiple sclerosis was recently published by the National Multiple Sclerosis Society, 270 Park Avenue, New York 17, New York. Copies are available without cost upon request of the physician. They are suitable for distribution to patients.

Four manuals for patients have been published, one for independently ambulatory patients, another for patients who are ambulatory with aids, a third for patients confined to wheel chairs, and the last for bed patients.

Service Separations

As a service to physicians and communities in this state desiring additional medical personnel, the Journal of the Kansas Medical Society will publish in this column each month the names of medical officers who will shortly be separated from the armed forces. These are men who volunteered from Kansas, and many of them will probably be interested in finding locations in this state. Anyone interested in contacting these physicians may write to the address here given.

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Case Report From The University of Kansas Medical Center

Clinical Pathological Conference

Pulmonary Fibrosis Secondary to Chronic, Indolent Pneumonia

Edited by Glen R. Shepherd, M.D., and Mahlon H. Delp, M.D., from recordings of the conference participated in by the departments of medicine, pathology, and radiology, and the junior and senior classes of medical students.

Case Presentation

A. S. (KUMC No. 52-7365), 60-year-old male farmer and mill worker, was admitted June 19, 1952, and expired July 4, 1952.

Chief complaints were shortness of breath, chest pain, cough and loss of weight.

History of the present illness was that two and one-half years ago, while carrying a bale of hay, there occurred sudden marked shortness of breath and substernal pain of such severity and duration that medical attention was sought. An EKG was taken at that time. Treatment was given for "asthma" without benefit. There had been 25 or 30 episodes similar to the initial one, except that the chest pain occurred over various areas anteriorly and laterally, the pain and severe dyspnea usually lasting about an hour.

Since the onset of symptoms, there had been a chronic cough productive of as much as a cupful of white or brown foamy sputum per day. There was never gross hemoptysis. For the past year marked hoarseness was noted. There had been a 30-pound weigh loss despite adequate diet.

Three months prior to admission, following a severe bout of dyspnea and chest pain, the patient was hospitalized for five weeks. Streptomycin was given. EKG and x-ray studies were made, the latter being reported to show pericardial effusion, mediastinal opacity, and collapse of the left lower lobe of the lung. ACTH, 10 mgm. three times a week, had been given a short time before admission. Three days before admission to KUMC, severe chest pain and dyspnea recurred and the patient was admitted for further examination and treatment.

The past history was not significant.

Family history revealed that the father died of cancer of the mouth. One brother died of lung trouble, said to be a fungus infection.

Systems review brought out a history of "sinus trouble" for 18 years.

The physical examination showed P 84, R 24, BP 120/88, T 98.4°. The patient was a well developed, thin, white man, dyspneic at rest. Lips were slightly cyanotic. Fingers and toes showed clubbing. EENT was normal. The trachea deviated to the right. The symmetrical chest had limited respiratory excursions, was resonant throughout, but moist rales were audible in both bases posteriorly, especially on the right. The non-enlarged heart had frequent ventricular premature contractions, tones of good quality and no thrills or murmurs. P_2 was louder than A_2. The abdomen showed only voluntary rigidity and an appendectomy scar. External genitalia and rectum were normal. The neurological examination was normal.

Laboratory findings: Urine—acid, 1.010 to 1.028 sp.gr., trace albumin, no sugar, few granular and hyaline casts. Blood examination showed RBC 4,490,000, Hb 12.8 gm. (83 per cent), WBC 9,900 to 12,400 with a differential count of 86 polys (F 81, NF 5), 8 lymphs, 2 eosinophiles and 4 monos. Sedimentation rate was 25 mm/hr. Wassermann and Kahn were negative. NPN 32 to 42 mgm. per cent. Creatinine 3 to 2.3 mgm. per cent. Blood sugar 28 to 86 mgm. per cent. Serum Na 139 to 145 milliequivalents, K 5 to 6 meq., Cl 95 to 96 meq., CO_2 33.3 to 38.6 meq. Total protein 6.2 gm. per cent with globulin 2.82 and albumin 3.38. Skin tests with tuberculin, histoplasmin, blastomycin, and coccidioidin were negative.

Total blood volume 3555 cc.—89 cc./kg (normal 70-85 cc./kg). Total plasma volume 2009 cc.—50 cc./kg. (normal 40-48 cc./kg). Total red cell mass 1546 cc.—38 cc./kg (normal 30-37 cc./kg). Arterial blood O_2—11.8 vol. per cent (69 per cent saturated); CO_2—61.6 vol. per cent. Venous blood O_2—4.3 vol. per cent (25 per cent saturated); CO_2—69.5 vol. per cent. Oxygen capacity 17.1 vol. per cent.

Sputum was negative for acid-fast bacilli and tumor cells.

Vital capacity was 450 to 600 cc. Venous pressure was 210 mm. of water. Circulation time—arm to tongue (decholin)—27 seconds.

During hospitalization, dyspnea was marked and oxygen was given much of the time. Mercurial diuretics, aminophyllin, digitalis, caffeine and cortisone were given. There seemed to be slight improvement. On the 16th day in the hospital, while sitting in a chair, the patient was found to be slumped down and cyanotic. There was no evidence of pain. Efforts at resuscitation were unsuccessful. Death was pronounced 10 minutes later.

Dr. Mahlon H. Delp (Chairman): Any questions of Dr. Slentz?

Question: Were these attacks precipitated by effort?

Dr. Edwin Slentz (Medicine Resident): No, they were not always associated with exertion.

Question: Was the patient aware of time of onset of the clubbing of his fingers?

Dr. Slentz: No.

Question: Was there ever increase in the respiratory rate?

Dr. Slentz: Yes, one recording indicates a rate of 32.

Dr. Delp: Someone noted a respiratory rate of 60 during one episode of dyspnea.

Question: Was he receiving nitroglycerine at the time of any of these attacks?

Dr. Slentz: No, I don't believe he had nitroglycerine.

Question: How long did it take to lose this weight?

Dr. Slentz: Two and one-half years.

Question: What sort of mill did he work in?

Dr. Slentz: He worked in a feed mill for over 17 years.

Question: Did the dyspnea last for a period of three hours or was that just the pain?

Dr. Delp: The dyspnea lasted considerably longer than the pain.

Question: During these spells of pain, was his heart ever irregular or did he have a moderate tachycardia?

Dr. Slentz: He had a tachycardia. To what degree, I don't know. Possibly it is one of the more important pertinent findings.

Dr. Delp: May we see the electrocardiogram now?

Dr. E. Grey Dimond (Medicine): A deep S wave in lead I indicates the main vector is pointing to the right of 90 degrees, maybe 110 to 120 degrees or even more to the right. Sharp prominent P waves appear which are sometimes said to be P "pulmonale" type P waves. Occasional ventricular premature contractions appear. Over the chest leads in the V 1 position, a P wave is quite prominent and the QRS is a complex which is mainly an R wave. The record is compatible with cor pulmonale. The rate is not too fast, perhaps 100.

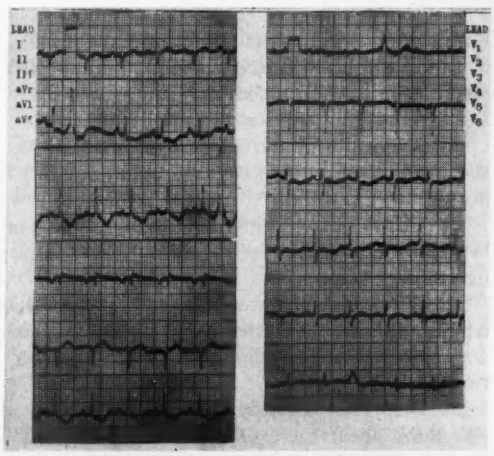

Figure 1. EKG taken June 20 and discussed in text.

Dr. Galen M. Tice (Radiology): We had access to several films that were made over a period of a few years prior to the time these films were made. On the films sent in, the patient had a definite increase in lung fibrosis. There was a progressive increase in the heart size. I was impressed on fluoroscopy with the marked retardation of the degree of pulsation. We didn't think the contour of the heart was very suggestive of pericardial effusion. Our film showed a prominent pulmonary outflow type shadow. It was a moderately large heart. There was right heart hypertrophy. I interpreted the changes out through the lung field as a combination of decompensation and fibrosis. I had seen previous films that showed part of this was fibrosis. Probably there was a pneumothorax with air and fluid in the right chest. The pleura showed some thickening down in the lateral aspect of the right chest.

Figure 2. X-ray taken June 20, showing a prominent pulmonary outflow type shadow, moderately large heart, and parenchymal evidence of decompensation and fibrosis.

Dr. Delp: Reviewing the history we note the patient worked a number of years in a mill. When we analyze that history a bit, it does not seem to be

as significant as if he had worked in some sort of a mill where ore was processed. The onset is highlighted by severe substernal chest pain. It also is associated with marked dyspnea. I hope we can eventually explain these symptoms. We should further explain the sudden death. Presented with a case in which there is pulmonary insufficiency, we should attempt to determine whether there is failure in ventilation, failure in respiration, or cardiopulmonary failure.

Differential Diagnosis

Mr. Charles Replogle (Senior Medical Student): I think that this is a case of pulmonary disease. However, I think first we should rule out several localized lesions which could cause this man's death.

First, an aneurysm can be ruled out by the radiographic studies. Secondly, we should consider a mediastinal tumor which, if present, could well be behind these areas of radiopacity.

In any case of diffuse pulmonary disease we sometimes think of fibrosis as the cause. We have to consider the possibility of the pneumoconioses. Silicosis is probably the most important form because of its diffuse involvement, while asbestosis, iron dust, and the like seem to produce more local necrosis of focal areas.

Inflammatory reactions must be considered, especially with tuberculosis in mind. However, the x-ray doesn't especially indicate that here, but it could be. Tuberculosis is not very apt to cause a cor pulmonale. Less than three per cent of the cases of tuberculosis so result. Further, we have a negative skin test, though this negativity could be present late in the disease. Also, there is negative sputum. Other inflammatory diseases such as histoplasmosis, coccidiomycosis and the like are to be considered. We have no history of chronic fever.

Thirdly, I would like to consider malignancies. Melanoma, hypernephroma, and metastasizing lymphoma could cause alterations in the pulmonary membrane preventing adequate oxygenation and causing rapidly developing dyspnea. The duration of this man's symptoms is not consistent with that for advanced carcinoma or malignancy.

This patient shows a vital capacity of 450 to 600 cc. The normal range for a man of 50 years or older is 2200 cc.

I think that this is a case of diffuse pulmonary fibrosis with the so-called alveolar capillary block syndrome.

I'd like to go into the possibility of primary pulmonary hypertension in this patient. Rather obviously, he had a cor pulmonale. On the basis of increased peripheral venous pressure, the increased pulmonary second sounds, increased arm to tongue circulation time, and the electrocardiographic findings, we are justified in making a diagnosis of cor pulmonale, even though there isn't much evidence of right heart enlargement on the roentgenograms.

This patient had episodes of cynanosis for possibly two years. The age of onset in this man is certainly against primary vascular sclerosis, which in itself is rare. Usually they are 20 to 40 years of age. Usually there isn't a coexisting or preceding pulmonary disease, of which we have definite evidence here. At rest in primary pulmonary hypertension, oxygen saturation of the arterial blood is usually at a normal level. With exercise, of course, it diminishes and is inadequate. This man at rest had inadequate oxygen saturation, with increased venous and arterial carbon dioxide levels. On these observations we can rule out primary vascular sclerosis or primary pulmonary hypertension. There are many causes of secondary cor pulmonale.

Providing that you rule out mediastinal tumor, this diagnosis becomes the so-called alveolar capillary block syndrome which is a diffuse pulmonary fibrosis and the result of emphysema, which probably preceded bronchiectasis and secondary infection.

In an attempt to explain the pain I'd like to suggest it as being due to pulmonary hypertension. Another factor which could produce this is dilatation of the right ventricle and the decreased ability of the coronary vessels to fill during late diastole.

As to the cause of painless death in this situation, I find that is a little harder to explain. I thought about the possibility of a pulmonary embolus due to the decreased blood flow or circulation rate and stasis, but I can't find any origin for this. He could have had a myocardial infarction. I couldn't decide which might have been the cause of death.

Clinical Discussion

Dr. Delp: Mr. Hollenbeck, why do you think this patient had pain?

Mr. Virgil Hollenbeck (Senior Medical Student): I think pulmonary arterial hypertension is the explanation, but it could have resulted from ruptured pleural blebs and pneumothorax.

Dr. Delp: Mr. Westcott?

Mr. Thomas S. Westcott (Senior Medical Student): Pulmonary hypertension pain is what I think.

Dr. Delp: Do you think there is any connection between the pain and the severe dyspnea this patient had?

Mr. Westcott: Yes, we almost always find this type of pulmonary hypertensive pain with dyspnea, with cyanosis and with signs of right cardiac hypertrophe.

Dr. Delp: Mr. Kennedy, would you tell me what you think about these CO_2 values—CO_2 of 33.3 meq., 38.6 meq.?

Mr. Lawrence L. Kennedy (Senior Medical Student): I think this patient was in respiratory acidosis because he was unable to breathe off the carbon dioxide.

Dr. Delp: Is respiratory acidosis accompanied by a rapid respiratory rate?

Mr. Kennedy: It should be to a certain extent until at a certain point the respiratory center is no longer susceptible to stimulation.

Dr. Delp: I notice that the nurses remark in their notes that the patient would refuse to stop taking oxygen. Does that mean anything to you? Do you think he might have been addicted to oxygen, or is that a legitimate term?

Mr. Kennedy: I think it is a possibility in an emphysematous patient with fibrosis.

Dr. Delp: Dr. Voth, from the data that we have available, do you think that this man had primarily ventilatory failure?

Dr. Harold Voth (Medicine): I checked the chart. The only studies we have are the vital capacity studies, which mean nothing as far as pulmonary function studies are concerned. From what we have available, I would perhaps put him in physiological classification four, which is cor pulmonale.

Dr. Delp: There is a little more information available on the protocol and in this chart with regard to the blood volume changes. Dr. Reissmann, I would like to have your comments concerning this part of it.

Dr. Kurt Reissmann (Medicine): We can say from the protocol that this was a man in severe anoxia and furthermore that this anoxia was arterial or respiratory as manifested by the lack of oxygen saturation of his arterial blood. In addition, there was some circulatory or stagnant anoxia as indicated by the very low oxygen saturation of the venous blood, the increased venous pressure and the long circulation time. The anoxia in this patient, however, was certainly not due to fibrosis and obliteration of the pulmonary capillary bed, because in those cases arterial anoxia does not occur. The low arterial oxygen saturation in this man indicates that a pulmonary disease was present, which prevented a normal gas exchange across the aveolar membrane. But from the vital capacity determination alone, we cannot decide whether emphysema or atelectasis due to an extended inflammatory process was the main factor.

At any rate, the anoxia in this man was so severe that it may account for his sudden death, because we know that whenever the arterial oxygen saturation approaches 60 per cent, a very critical situation arises and values lower than 60 per cent are not compatible with life. So I would not be surprised to hear that the pathologist did not find any direct cause of death other than severe manifestations of anoxia.

Now a few words about the blood volume. Presumably the anoxia of this man was present for quite a time, but we found no increase in red cell mass as we are used to finding in longstanding anoxemia. I believe that in this case either an anemia of infection or an anemia of tumor concurred and prevented a polycythemia developing.

Dr. Delp: Dr. Dimond, do you have any evidence from this story so far given that this man did belong to Cournand's group four, with true cardiopulmonary involvement? Do you think you could conclude that from the EKG or any other evidence we have?

Dr. Dimond: This electrocardiogram should indicate strain or increased pressure in the pulmonary circuit producing this cor pulmonale. The markedly prolonged circulation time, some 25 per cent above normal, and the increased venous pressure (rather than right heart pressure) would indicate that in association with ventilatory difficulty and his capillary alveolar difficulty, he also had a failing right heart.

As to his sudden death, I would like to mention the lungs. The fact that this person had chest pain first of all makes you think of heart disease, but he had been having recurrent chest pain moving around over his chest. I'd be more inclined to think that he was rupturing emphysematous blebs. In checking his EKG's and clinical notes for a clue to his sudden death, we find that he was having frequent ventricular premature contractions which may indicate that he died from ventricular arrhythmia. Also, the fact that he had extreme pressure upon his right heart suggests death from coronary occlusion involving the right heart rather than the left heart, which you don't see very often, but he'd be a candidate for it.

Dr. Delp: Perhaps we are overstressing the symptom of pain, but it seems to me a rather interesting item in the history. I would like to poll two more people, asking about the pain and their opinion as to why the man died suddenly. Dr. Rankin?

Dr. Thomas J. Rankin (Medicine): My feeling about his sudden death would be Dr. Dimond's last choice. He more likely died of ventricular arrhythmia secondary to further development of strain on his heart. X-rays show a partial pneumothorax which might have been present at one time when he had these severe episodes of pain which were interpreted as coronary occlusion by his physician. Pleural pain, as people often have after such an episode, would explain part of this pain, the pulmonary hypertension part of it, coronary insufficiency another part. So I think we may be belaboring the issue in trying to get all those pains into the same category. The only further suspicion I would elect to nomi-

nate here is his occupation as a mill worker. There is a possibility, although faint, that thrombosis might have started the whole thing.

Dr. Delp: Dr. Berry?

Dr. Max Berry (Medicine): Here is a fellow with a pneumothorax on the x-ray who had episodes of pain. I don't mean this in any derogatory way toward the x-ray department because this was done elsewhere, but I think they might have been influenced a bit by the physical findings when they made that x-ray diagnosis of pericarditis. A not too uncommon clinical syndrome could explain this man's picture. That is the syndrome of mediastinal emphysema. He had a beautiful set-up for it. He had a pneumothorax that even I can surmise on these films from x-ray. A pneumothorax or a rupture of the continuity of the lung is necessary to produce emphysema in the mediastinal space. Somebody made a diagnosis of pericarditis, which is not an uncommon diagnosis in patients who have the crunching sound that occurs with mediastinal emphysema.

I don't believe this is cardiac pain. The reason for it is that we have to go on the assumption, which is more or less borne out clinically, that any pain in the chest is due to the heart, due to a coronary artery disease, and if it lasts over 30 minutes, it is probably myocardial infarction. There are symptoms of that, of course, but if this man had 20 or 30, or whatever it was, episodes of pain that lasted an hour, then he didn't have 20 or 30 episodes of myocardial infarction.

Pathology Report

Dr. Ann Pollak (Pathology): Grossly, the lungs showed diffuse fibrosis, together with many areas of consolidation which were patchy, some gray and others red. Both lungs were definitely increased in density throughout. Microscopy revealed an extensive chronic pneumonitis with early organization. This was characterized by areas in which all of the alveoli were filled with macrophages with a moderate number of polymorphonuclear leukocytes embedded in an amorphous pink-staining network, apparently consisting of fibrin and cytoplasm. Some areas were confluent in distribution, others were patchy. The bronchi were dilated and partly filled with similar material. In other areas the process had gone on to extensive fibrosis with complete disorganization of the lung architecture. In these areas, there appeared extensive endarteritis of pulmonary arteries and also of the bronchial arteries.

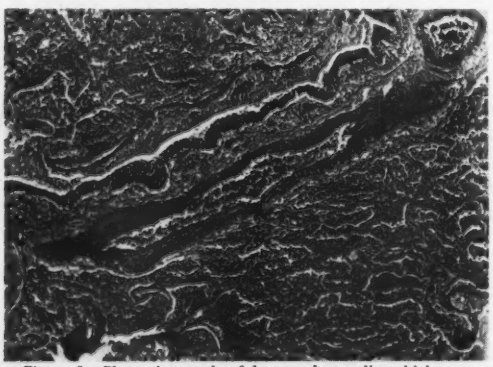

Figure 3. Photomicrograph of lung under medium high power, showing chronic active organizing pneumonia. This is one of the more acute areas. Other areas show more fibrosis than this.

Incidental findings were generalized atherosclerosis excepting the coronary arteries, chronic nephrosclerosis, focal chronic pericarditis, pleural adhesions, and adenomata of the prostate.

This case represents what appears to be a definite clinical syndrome of a progressive, chronic, and indolent type of pneumonia proceeding to organization and eventually right heart failure. There have been several cases of this nature reported in old men. The cause is not definitely known.

This may represent some virus pneumonitis that has not healed for some reason and becomes chronic. It may represent pneumococcal pneumonia treated with antibiotics but without resolution of the pneumonitis because of the extensive damage. Stains of these lung preparations did not show bacteria. Cultures were negative for fungi and tubercle bacilli.

Other factors which could conceivably cause this pathological change are irritating chemical agents, such physical agents as radiation or radioactive dust, or possibly an obscure allergy. Some evidence of an hereditary predisposition lies in similar changes occurring in the lungs of identical twins who had been separated for 25 years.

I don't know why he had pain in his chest. Possibly that is explained by the emphysema and the acute pleurisy in one area. Adhesions around the upper lobe probably relate to previous episodes of pleurisy.

Dr. Reissmann: Is this so-called chronic pneumonia a generalized or a localized process?

Dr. Pollak: It was generalized—it involved all of both lungs.

Dr. Delp: Why did this man die?

Dr. Pollak: That I can't answer.

Dr. Tice: Do you think you might miss a small area of pneumothorax?

Dr. Pollak: Yes.

Summary

A 60-year-old man suffered with recurrent episodes of chest pain and dyspnea over a two-year period. Clinical observations indicated pulmonary fibrosis with progressive ventilatory and respiratory failure, eventually culminating in death due to cardio-pulmonary failure.

The history of long exposure to dust in feed mill

work is inadequate from the standpoint of pathogenesis. Explanations of the chest pain are unsatisfactory. Finally, the pathologist offers the evidence of a longstanding pneumonia which has proceeded to organization.

With the variety of antibiotics available and our rather casual use of these agents, have we lost our respect for and proper skill in dealing with infections?

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BLUE SHIELD

New Year's Report

The year 1952 has been a fairly successful one for Blue Cross and Blue Shield, considering the fact that a rate change had been made in the late summer of 1951. The statistician's report which follows should be of interest to the medical profession in Kansas.

Blue Shield has now enrolled about 20 per cent of the eligible population in the Kansas plan area. This comprises all of the state except Johnson and Wyandotte Counties which are covered by the Kansas City plan. The net enrollment will pass the 300,000 member mark by February, 1953. During 1952, the net growth in enrollment was 30,000 members as compared with 13,000 members the previous year.

Blue Cross covers over 25 per cent of the eligible population in the plan area. Members covered by Blue Cross as of December 1952 were 403,000. The net growth for Blue Cross was 6,000 members in 1952. The small net increase in Blue Cross enrollment during the year may be attributed to the abnormally high cancellation rate during the early months of 1952. This was a direct result of the increase in dues. The increase in dues was announced to members in the first payment notices they received after August 1, 1951. A portion of the members was billed for the first time at the new rate each month through July, 1952. Overall it appears that about 95 per cent of the members accepted the increased benefits and the higher rate. About five per cent of the members cancelled because of the rate increase.

The 1952 increase in hospital days used per 1,000 members was approximately 12 per cent above the 1951 level of utilization. An increased admission rate accounted for seven per cent of the overall increase. The other five per cent of the over-all increase in hospital days covered was due to an increase in length of stay of three-tenths of a day per admission.

Blue Shield income from membership dues exceeded $3,100,000 in 1952. Eighty-one per cent of the income was used to pay for services provided by the Membership Agreement. Operating expenses amounted to about 11 per cent of income, and approximately eight per cent of income was placed in the general reserve account of the plan.

Blue Cross income from membership dues amounted to over $6,100,000 for 1952. Eighty-six per cent of the income was used to pay for hospital cases. Operating expenses amounted to about eight per cent of income, and nearly six per cent of income was placed in the general reserve account.

In 1953, the ever increasing number of days of hospital care per 1000 members presents the greatest problem for both Blue Cross and Blue Shield. If the number of days of hospital care per 1000 members continues to increase, Blue Cross will soon be drawing on its general reserve account to pay for hospital cases. The plans' general reserves are comparable to an individual's savings account. It is undesirable to continue to withdraw money from either a general reserve or a savings account to finance current costs over a long period of time.

Your careful consideration as to the number of hospital days of care each of your patients receives in 1953 will assist Blue Cross and Blue Shield in completing another successful year.

Pulmonary tuberculosis should be regarded as a potentially curable disease, if by "cure" is meant the return of a patient to gainful occupation for a period of five years or more without detectable reactivation of the disease. In one institution it has been demonstrated that such "cure" can be effected in 98 per cent of minimal cases, approximately 85 per cent of moderately advanced cases, and in even 40 to 60 per cent of far-advanced or most hopeless cases, with the application of scientific knowledge currently available and the active cooperation of all concerned, for an overall "cure" rate of approximately 80 per cent.—*William B. Tucker, M.D., Hoosier Health Herald, March, 1951.*

The Sedgwick County Medical Society is completing plans for the scientific session of the 94th annual session of the Kansas Medical Society. The meeting will be held in Wichita, May 4-7, 1953.

Advertisers in the Journal are entitled to the patronage of Kansas physicians.

ACTIVITIES OF MEMBERS

Dr. Paul R. Slater, Wichita, recently became a diplomate of the American Board of Preventive Medicine.

* * *

Dr. Dean Chaffee, Abilene physician for the past six years, was recently recalled to active duty with the Navy. He reported at Kansas City on December 1.

* * *

Dr. J. P. Haigler, Hays, announces that Dr. William C. McDermott, formerly of New York City, is now associated with him in practice. Dr. McDermott, who obtained his medical degree at Cornell University, is a veteran of World War II.

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Dr. A. W. Fegtly, Wichita, was recently appointed chairman of the Committee on Constitution and By-Laws of the American Academy of General Practice.

* * *

The Salina Clinic announces that Dr. C. A. Hartenbower, who has been practicing in Gypsum for the past six months, is now a member of its staff. Dr. Hartenbower will continue to spend two days each week in Gypsum.

* * *

Dr. Charles R. Hopper, who has been in military service since February, 1951, has returned to Emporia and is resuming practice in association with Dr. C. C. Underwood. Before his release from the service, Dr. Hopper was presented a citation for outstanding achievement.

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Dr. C. C. Tucker, Wichita, presented a paper on proctology at a recent meeting of the Southern Medical Association in Miami, Florida.

* * *

Dr. Ralph R. Preston, Topeka, was recently called to active Navy duty. He reported at the Naval Dispensary, Washington, D. C., on December 1.

* * *

Dr. C. S. Huffman, Columbus, was the subject of a feature story in the *Columbus Modern Light* on November 27. The story told of Dr. Huffman's civic, political and professional life and mentioned his selection as "Doctor of the Year" for Kansas in 1948.

* * *

Dr. Dale Smith, who has been practicing in Fredonia since World War II, is closing his office there to become a member of the staff of the Mayo Clinic.

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A story in the *Marshall County News* on December 1 paid tribute to Dr. H. S. Haerle, Marysville, who traveled by jeep and on foot to administer care to his patients during the pre-Thanksgiving blizzard in that community.

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Dr. M. C. McComas, Jr., Concordia, was scientific speaker at a meeting of the staff of Smith County Memorial Hospital, Smith Center, recently. He showed pathological slides and x-ray pictures for study by the group.

* * *

Dr. E. M. Seydell, Wichita, who spoke before a professional group in Tokyo recently, was elected an honorary member of the Japan Broncho-Esophagological Society during his visit in that country.

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Dr. Walter J. Singleton, La Crosse, spoke on "Mental Health" before the La Crosse Community Unit at a meeting held in November.

* * *

Dr. and Mrs. C. Omer West recently returned from a trip to Europe where Dr. West attended a meeting of the World Medical Association in Athens. They also visited in Germany, Switzerland, Italy and Egypt.

* * *

Dr. George A. Westfall, Jr., who recently completed two years service with the 343rd General Hospital in Japan, returned to this country in November and has resumed practice at the Hertzler Clinic in Halstead.

* * *

Dr. James A. Wheeler, Newton, presented an exhibit on western equine virus at the Denver meeting of the A.M.A. last month. Dr. Charles T. Sills, Newton, assisted in the presentation.

* * *

Dr. James B. Weaver, Kansas City, was presented a certificate of honorary membership in the Lawrence Kiwanis Club last month in recognition of his long service with the orthopedic clinic sponsored by the club. Dr. W. O. Nelson, Lawrence, introduced Dr. Weaver at the meeting.

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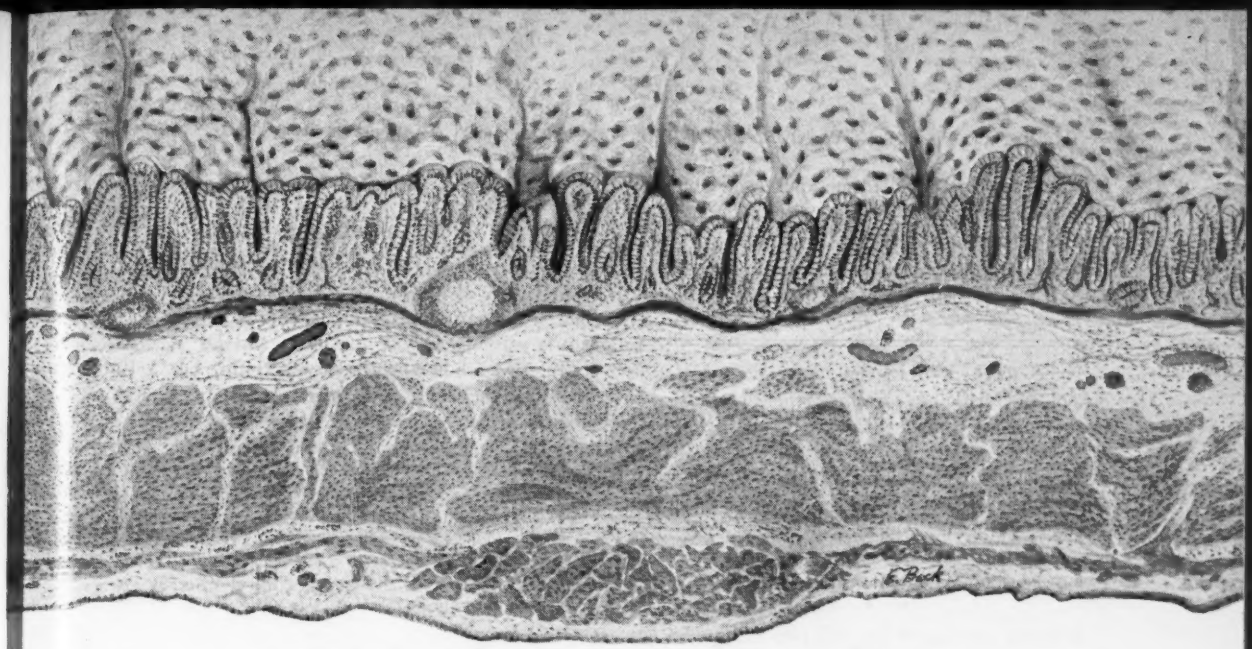
Dr. F. L. Loveland resigned recently as a member of the medical examining board for the Topeka police and fire departments, and Dr. Lloyd Schwartz was appointed to fill the vacancy. Dr. Omer M. Raines has been named chairman of the board.

* * *

Dr. H. M. Waldorf, Jr., who has been practicing in Greensburg for two years, was called to active duty with the armed forces early this month. He is stationed at Gunter Field Air Base, Montgomery, Alabama.

* * *

An oxygen tent now in use at the Stevens County



Normal peristaltic action results from activity of the muscle layers as they are gently distended by bulk within the intestine; mucosal irritants cause overactivity of the muscle layers resulting in hyperperistalsis or spasm.

Corrective Action of Metamucil® in Abnormal Physiology of Constipation

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On the other hand, the muscularis does require a stimulus to initiate peristalsis. This physiologic stimulus is the mechanism by which bland distention of the colon establishes a reflex, with the muscularis at the terminus of the reflex arc.

Metamucil literally reeducates the sluggish and also the spastic colon. Taken with adequate amounts of water, Metamucil forms a smooth, hydrophilic colloid. As this colloidal mass passes through the large intestine, it exerts a gentle, distending pressure within the lumen, thus initiating the peristaltic reflex necessary for evacuation.

A program of Metamucil therapy helps to restore proper tone to the intestinal musculature, thereby establishing proper bowel habits.

Metamucil® is the highly refined mucilloid of Plantago ovata (50%), a seed of the psyllium group, combined with dextrose (50%) as a dispersing agent. It is accepted by the Council on Pharmacy and Chemistry of the American Medical Association.

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Research in the Service of Medicine

Hospital was purchased from funds contributed by friends of the late Dr. William R. Kenoyer, Hugoton, as a memorial to him.

COUNTY SOCIETIES

Three speakers from the University of Kansas School of Medicine presented the program at a meeting of the Sedgwick County Society held at the Allis Hotel on December 2. Dr. W. Clarke Wescoe, dean, spoke on "Non-specific Matters Pertaining to the Medical School in General," Dr. Fred Kittle discussed "The Indications for Mitral Valvulotomy," and Dr. Kurt Reissmann presented "Anoxia: Its Patho-physiology and Clinical Implications."

* * *

A recent meeting of the Jefferson County Society was held at the home of Dr. and Mrs. F. W. Huston, Winchester. Fifteen physicians were present and viewed a scale model of the Jefferson County Memorial Hospital.

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The Wilson County Society and Auxiliary held a dinner meeting in Neodesha recently. The physicians later went to the office of Dr. Frank A. Moorhead for a business session.

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All members of the Atchison County Society were present at a clinical pathological conference held at the Atchison Hospital on December 9. Speakers were Dr. Kenneth Hollweg and Dr. A. Jollfe, both of Kansas City. A breakfast preceded the conference.

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Twenty-five physicians were present for a meeting of the Central Kansas Medical Society held at Russell on December 11. Dr. W. Clarke Wescoe, Dr. Kurt Reissmann and Dr. Fred Kittle, all of the University of Kansas Medical Center, presented the program.

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A meeting of the Brown County Society was held at Hiawatha on December 5. Guests were Dr. Lucien R. Pyle, Topeka, who spoke on Kansas Voluntary Advisory Committee activities, and Mr. Oliver E. Ebel, Topeka, who discussed indigent health care in Kansas.

* * *

The monthly meeting of the Marion County Society was held at the Kingfisher Inn at the Marion County Lake on December 10. Members of the Auxiliary were guests for the dinner, after which separate meetings were held. At the business session at the office of Dr. G. J. Goodsheller and Dr. T. C. Ensey, the following officers were elected for 1953: president, Dr. T. C. Ensey, Marion; vice president, Dr. A. C. Eitzen, Hillsboro; secretary-treasurer, Dr. C. R. Magee, Marion.

* * *

Dr. H. L. Patterson was named president of the Pawnee County Society at a meeting held at the Blue Goose, Larned, on December 3. Dr. Earl F. Morris was named vice president, and Dr. George J. Millet was chosen as secretary-treasurer. Dr. O. R. Cram will be delegate to meetings of the Kansas Medical Society. The group formed plans to open a cancer detection clinic at St. Joseph Memorial Hospital.

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Dr. Chester L. Young and Dr. William T. Sirridge were speakers at a meeting of the Wyandotte County Society held in Kansas City December 16. The subject of the program was "Pancreatitis."

* * *

Members of the Marion County Society were hosts at a meeting of the Tri-County Society held at Marion on November 20. Physicians and their wives were present from Marion, McPherson and Harvey counties. Dr. Warren F. Bernstorf, Winfield, president of the Kansas Medical Society, and Mr. Oliver E. Ebel, Topeka, executive secretary, presented the program, speaking on the dangers of Communism.

* * *

A meeting of the Southeast Kansas Medical Society was held at the Parsons Country Club on December 10. Dr. Fred J. McEwen and Dr. Arthur H. Bacon, both of Wichita, presented the scientific program.

September is the healthiest month of the year, judging from the way life insurance death claims are distributed across the calendar, reported a recent release from the Institute of Life Insurance. The fact is also borne out by mortality statistics for the population as a whole. The index of life policy death benefits shows a steady rise after September, until the year's peak is reached in March.

DEATH NOTICES

VICTOR ROBERT PARKER, M.D.

Dr. Victor R. Parker, 63, an active member of the Osborne County Medical Society, died December 3 in Kansas City. A graduate of the Southwest School of Medicine, Kansas City, in 1913, Dr. Parker began practice immediately afterward in Kansas, locating in Covert. In 1921 he moved to Natoma, where he continued to practice until his death.

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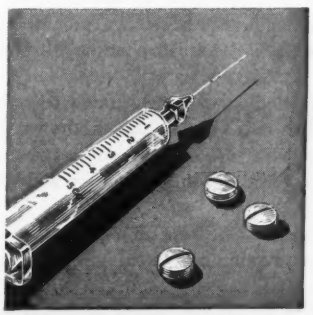

Senior Thesis from the University of Kansas Medical School*

Interpretation of the Blood Sedimentation Rate

Kenneth E. Hedrick**

Kansas City, Kansas

Is this blood sedimentation rate abnormal, and if so what does it mean? This is a commonplace question which arises in the minds of students of medicine and physicians alike. The erythrocyte or blood sedimentation rate (B.S.R. or E.S.R.) is probably the most controversial of the common laboratory procedures. Such debate about the status of the test as an index of ill health leaves one in utter confusion. Certainly a consideration and interpretation of the test is justified.

History

Centuries ago the Greeks observed variations in the settling rate of blood withdrawn from ill patients, and it was from these observations that the humoral theory of disease was developed. They noticed the separation of the blood into four layers which they called cholera, phlegma, sanguis, and melancholia. It was theorized that disease was a result of an imbalance of the four "humors," and on this basis they evaluated the condition of their patients.

The humoral theory eventually fell into disfavor, but the belief that an increase in phlegma, the fibrin layer, was a predominant factor in the production of disease continued until the 19th century. The fibrin was considered alien to the blood, and the rationale of bloodletting was to relieve the body of this antagonizing substance.

It was not until 1921 that Fahraeus made the test practical by adding anticoagulant to the blood. He then established standards of normality and abnormality for the sedimentation phenomenon. From that time the use of the procedure has grown rapidly to the popularity it enjoys today.

Theory

The blood is, essentially, a suspension of corpuscles in plasma, and the B.S.R. is a measure of the stability of this suspension. The nature of the settling phenomenon is not clear, probably because of the multiplicity of influencing factors. However, through research, a number of these factors have been elucidated. Fahraeus demonstrated correlations between the degree of rouleaux formation, the quantity of plasma constituents, and the sedimentating velocity of red cells.

Rouleaux formation is apparently predominantly determined by the concentration of the protein constituents of the plasma. There is a balance of "active" against "inhibitory" proteins—the fibrinogen and globulin being the most active and the albumin and nucleoproteins being the most inhibitory.[3] Alterations in the balance of plasma proteins, particularly an increase in fibrinogen, are likely to occur in any condition involving tissue destruction or infection. The explanation of this increase is unknown, but it has been suggested that in disease the breakdown of body tissue releases increased amounts of fibrinogen which, in turn, induces rouleaux formation and hence increases sedimentation. Other constituents of the blood seem to play but a small part in blood sedimentation.

Three phases are recognized in the fall of the erythrocytes. The first is a period of rouleaux formation with progressive increases in size of the red cell aggregates. The second phase is a long one of free fall which coincides with the development of the cell clusters to their maximum size. The third phase is one of additional or final settling. The relative duration of these phases is determined principally by the length and diameter of the tube.

Procedure

The procedure of the B.S.R. is relatively simple. A graduated tube, into which anticoagulant has been added, is filled to a measured height with freshly drawn blood. After a given time, the depth of the clear plasma forming above the settling cells is measured and the settling rate of the erythrocytes is established.

Extrinsic factors which tend to alter the results of the B.S.R. are due to errors in technique. If the following technical points are adhered to, many of those errors can be eliminated:

1. Pressure on the vein should be minimal when the blood is withdrawn.
2. The blood and the anticoagulant should be mixed thoroughly as soon as possible after withdrawal.
3. The test should be run within a few hours, preferably within two hours after withdrawal.
4. Glassware and needles should be clean and dry so as to prevent dilution and contact with chemicals.
5. The tubes must be kept in a vertical position to achieve the maximum retarding effect of the plasma.
6. Bubbles of air in the column of blood should be avoided.

*This is one of 11 senior theses selected for publication by the Editorial Board from a group of 15 judged the best by the faculty of the University of Kansas School of Medicine.

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7. The internal diameter of the tube should not be under two mm. Otherwise, irregularities may occur due to temporary blockage.

8. Extreme temperatures must be avoided.

9. Shaking the blood vigorously for at least two to three minutes will keep the settling error, due to mixing, to within two mm.

10. The anticoagulants recommended by the standard methods should be used.

If the procedure is done properly with these points in mind, the results of repeated tests on the same blood specimen should not vary more than two per cent.

Methods

All of the B.S.R. methods are measurements of distance of fall against time, but their results cannot be readily interchanged. Considerations of the four common methods are to be seen in Figure 1.

narrower than two mm. may cause uneven sedimentation, and for this reason micro-methods, using capillary tubes, are said to be unsatisfactory.[4]

Common Altering Factors

Normal alterations may occur in the B.S.R.'s of healthy individuals. Healthy women usually have rates nearly double that for normal men. The mean sedimentation rate is extremely low in infancy and increases to a maximum at puberty, whereafter it slowly decreases until the onset of old age when it rises again. By the Westergren method, Wilhelm and Tillisch[7] found that an elderly person has a normal rate of 35 to 40 mm. in comparison with the normal 20 mm. of a young adult.

Alterations in sedimentation may occur with temperature and climate changes, exercise, menstruation, pregnancy, digestion, and smoking, but with the exception of pregnancy, these alterations are

Methods of Sedimentation

Method	Length of Tube	Height of Blood Column	Diameter of Tube	Anti-coagulant	Method of Reading	Normal Range
Westergren	300 mm.	200 mm.	2.5 mm.	3.8% sodium citrate	mm/60min.	1-3 mm. m. 4-7 mm. f.
Wintrobe	120 mm.	100 mm.	25 mm.	Pot. and Ammon. oxalate (dry)	mm/60min.	2-8 mm. m. 2-10 mm. f.
Cutler	70 mm.	50 mm.	5 mm.	3% sodium citrate	mm/60min. (read and plotted every 5 mm.)	0-9 mm. m. 0-15 mm. f.
Linzenmeier	65 mm.	50 mm.	5 mm.	5% sodium citrate	minutes to settle 18 mm.	350-1500 mm. m. 200-600 mm. f.

Figure 1

Each of the methods has its advantages and disadvantages. The Wintrobe method has the advantage of facilitating hematological work and anemia corrections because it utilizes a hematocrit type of tube and a dry anticoagulant. Many British authorities[1,23] feel that the Westergren method is superior for general purposes. The long tube, along with an anticoagulant of sodium citrate solution, provides a retardation of red cells, thereby effecting more accurate and sensitive readings. The frequent readings of the Cutler method provide the clinician with a graphic curve which yields additional information.

Some workers have devised micro methods which are done in capillary tubes. These methods are said to be valuable procedures in pediatrics; they eliminate frequent venous punctures. However, tubes

not likely to confuse the interpretation. Sedimentation rates in a number of normal men and women were found to vary from week to week but always within normal limits.[2] Rarely does a definitely accelerated rate appear in individuals with normal health and vice versa. B.S.R.'s return to normal slowly after an elevation. Patients who have had acute infections in preceding weeks often show a high rate without an immediate real cause.

The only physiological factor causing a marked elevation in the B.S.R. is pregnancy. The rate is elevated in both the normal pregnancy and puerperium. An elevation of a few mms. to a level of 50 mm./hr. is a normal occurrence; however, an infection will reflect an additional rise in the B.S.R.[19] The return to normal begins about the

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DIAGNOSIS AND TREATMENT OF CANCER OF THE UTERUS

The following recommendations of the Subcommittee on Exfoliative Cytology were adopted by the Medical and Scientific Committee of the American Cancer Society on June 3, 1952, for dissemination to the medical profession:

1. No surgeon should operate for cancer of the uterus without biopsy confirmation.

2. Patients with positive vaginal smears should be thoroughly investigated. Upon completion of this study adequate treatment should be instituted.

Pathologically Speaking

SEDIMENTATION RATE

THE RATE of settling or sedimentation of the red blood cells in whole blood which is mixed with an anticoagulant is known as the sedimentation rate.

Increased settling of red cells in disease has been appreciated for some time. Use of this phenomenon as a laboratory aid in clinical diagnosis is well established.

The exact nature of the underlying factors involved in the settling of red cells in disease is apparently related to alterations in plasma proteins and perhaps cholesterol. The total number and form of red cells are important factors.

The methods of measuring sedimentation rates are of two main types: (1) the time is fixed, and the extent of sedimentation during that period is recorded; (2) the distance of fall is fixed, and the time required to reach that distance is registered. Normal range will depend upon the method used.

The technical features of the test, regardless of method used, also vary according to (1) height of tube, (2) diameter of tube, (3) position of tube, (4) type of anticoagulant. The test should be done on a fasting specimen at room temperature and within one hour of obtaining the sample.

One method includes estimation of packed cell volume so that the sedimentation rate can be "corrected" in relation to any degree of anemia or other red cell discrepancy which may be present.

The sedimentation rate is rapid in diseases in which tissue destruction is taking place; this may be due to the inflammatory or degenerative processes which occur in tumors.

Diseases such as rheumatic fever, pulmonary tuberculosis, gout, rheumatoid arthritis, and most acute pyogenic diseases give rapid sedimentation rates. Acute myocardial infarction also will produce elevation of the sedimentation rate, and the procedure is of great value in following the course of this disease in regards to the stages of healing and the activity to be allowed.

Frequently, when the physician is faced with a diagnostic problem in which it is difficult to establish an organic or a psychosomatic basis in the case, the sedimentation rate, if elevated, will caution him to study the patient again minutely for evidence of organic disease. But it must always be remembered that a normal rate of red cell sedimentation does not necessarily mean an absence of disease.

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fourth postpartum week, and the pre-pregnancy level is reached about the 16th week postpartum.

Some drugs are considered responsible for changes in the B.S.R. Large doses of salicylates may lower the rate of non-rheumatic as well as that of rheumatic patients.[25] It is suggested by Fearnly and Banim,[15] that a normal B.S.R. may not be a reliable index of the absence of rheumatic activity in patients being treated with ACTH or cortisone. They postulate a non-specific effect of hormones in lowering the rates. In dosages employed clinically, heparin and dicumarol do not significantly alter the B.S.R.[5,21]

Blood factors often alter the results of the B.S.R. The number, size, and shape of the erythrocytes are the principal altering influences. Anemias and hydremias are the most important intrinsic factors disturbing the B.S.R.; they tend to elevate the sedimentation readings. Oligocythemias accelerate the rate, and polycythemias retard the rate. Correction of the deviations caused by anemias have been attempted by manipulating the packed cell volumes to normal, either by laboratory means before testing sedimentation or by the use of correction charts. The usefulness of these correction methods is criticized by Poole and Summers[6] in the light of their experimental studies. By correcting the B.S.R., one is possibly interfering with the underlying mechanism of the settling phenomenon. The compensating factors of an anemia are predominantly unknown, and the anemia may be merely a symptom of a complicating disease which in itself is the cause of the abnormal rate. Consequently, single B.S.R.'s in anemic conditions are of doubtful value, and the correction methods have by no means gained general acceptance.

Clinical Applications

Clinicians seek objective evidence of disease to compare with subjective judgment. This objective evidence must be associated in a quantitative way to the severity and rate of change of the disease process. Some tests, such as those on blood chemistry, are specific in that they relate the status of certain metabolic functions. But the B.S.R. is a nonspecific test which may be compared roughly with the temperature, pulse and leucocyte count in that it gives information of a general character. The nature of the organic disease is not indicated, but those conditions which cause an accelerated sedimentation rate are those with tissue destruction, infection, or intoxication.

The B.S.R. is a valuable aid in diagnosis, treatment and prognosis over a wide field of clinical areas. The test may serve as a diagnostic lead whereby the presence of a disease process is uncovered, or it may be used as an added tool in the completion of a diagnosis. The B.S.R. may be the only or the most accurate evidence of favorable or unfavorable response to treatment. It is often quite helpful in controlling the therapeutic regime, particularly in chronic diseases. By means of the B.S.R., the prognosis of a patient may be determined, and occasionally it is the only warning of impending disaster among promising clinical signs.

The B.S.R. is of little value in the early diagnosis of acute infections, but it is most valuable in revealing the development of complications. Mild catarrhal inflammations most frequently register normal, but even a common cold may cause acceleration. Suppurative conditions and inflammations of the serous cavities usually elevate the rate to high levels.

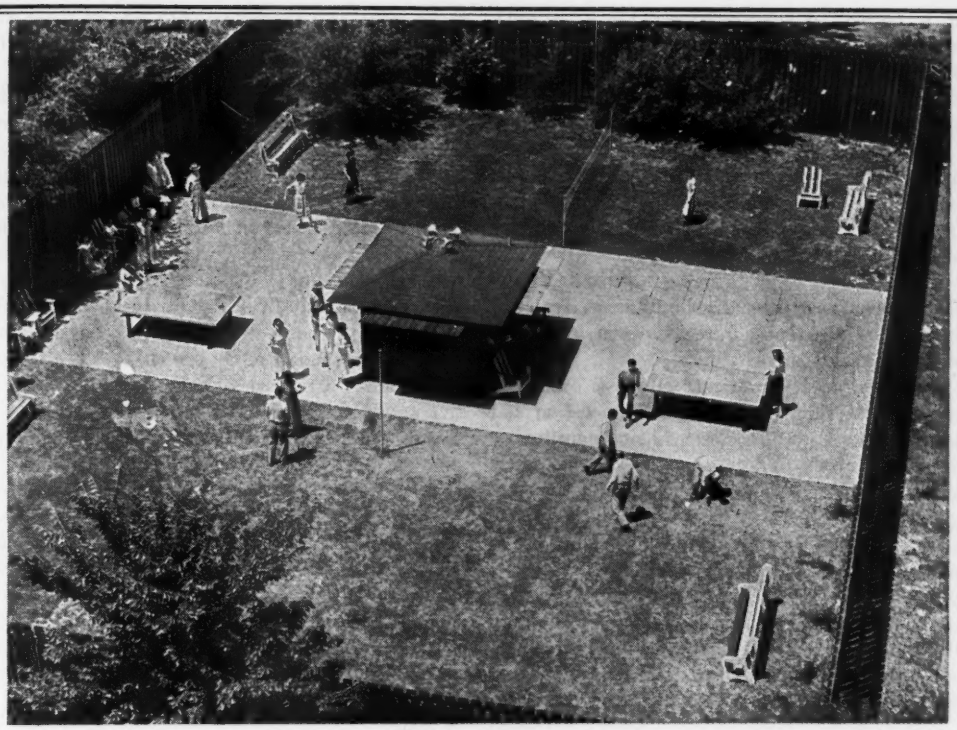
Specific Pathological Conditions

The height of the sedimentation curve has long been used as an indicator of the extent and activity of pulmonary pathology. One of the commonest applications of the B.S.R. is in the detection and management of tuberculosis. The test is, perhaps, more valuable in chronic than in acute tuberculosis. In one series,[4] 26 per cent of the patients with active tuberculosis were reported as having normal sedimentation rates. On the other hand, an elevated B.S.R. may be indicative of the presence of disease in the absence of any clinical signs, especially patients with latent tuberculosis. In a child three to four years of age with a positive tuberculin and a normal or equivocal chest x-ray, the question arises as to whether the child's disease is active or quiescent. In the presence of an elevated B.S.R., one can assume the lesion is probably still active, while a normal B.S.R. leads to the assumption that the lesion has healed.

In chronic tuberculosis the B.S.R. is increased and may be used as an index of activity, thereby providing an aid in treatment and prognosis. Usually the rate gradually falls as healing takes place. In normal cases of uncomplicated pulmonary tuberculosis, the sedimentation follows fairly faithfully the clinical condition of the patient.[10] Complications such as pneumothorax with fluid formation, pleural effusion, abscess formation, meningitis, and fisulae are suggested by rising rates.

Cases of tuberculosis are not arrested in the face of a rising sedimentation level. In tuberculosis the B.S.R. should be used in conjunction with all other clinical and laboratory data. When used properly, it is of great value; improperly used the test is valueless and perhaps detrimental.

Acute onsets of pneumonia cause extremely increased rates which gradually decrease with convalescence. Complications such as pleurisy, empyema, or pericarditis precipitate a sudden sharp increase in the rates. The B.S.R. is increased in atypical pneumonia, even in the absence of x-ray findings,



Outdoor Recreation Area

In psychiatric therapy recreation is not only "therapy", but play as well. It is important that patients have a chance to get out of their sleeping rooms. The new recreation area at the Neurological Hospital offers almost every patient within a few days after admission, a chance "to get out of the sleeping areas".

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but is normal in the commoner forms of mild respiratory infections. The B.S.R. is of considerable assistance in determining the time when a patient recovering from atypical pneumonia may resume normal activities.

Data on 65 cases of silicosis[14] suggest that an abnormal B.S.R. is not of value in assessing when a case of silicosis is complicated by pulmonary infection. Possibly this is because all such cases are infected to some degree.

Noninfective allergic disorders such as asthma and hay fever have normal sedimentation rates, but the rates are frequently increased when inflammatory complications occur.

Neoplasms exert a variable effect according to their nature (simple or malignant), location and extent. Generally sedimentation is not significantly altered by simple tumors or cysts, but is usually definitely abnormal in cases with proliferating malignant tumors.[25] Ulcerations, perforations, tissue destruction, necrosis, and upsets in metabolism cause increased rates. Differential aid is often provided by the B.S.R. in determining the malignant tendencies of tumors. For example, if anemias be taken into consideration, the B.S.R. may help differentiate gastric ulcers from gastric carcinomas. In conjunction with the acid phosphatase test, the B.S.R. is of some help in the early diagnosis of carcinomas of the prostate. The presence of skeletal metastasis raises the sedimentation rate.

In Hodgkin's disease and other lymphomas, the sedimentation rate may serve as a guide to radiological therapy. The rate is raised during active proliferation but tends to return to normal during phases of inactivity. A rise may indicate the need for retreatment.

Mayo Clinic physicians[13] found the B.S.R. of value in recognizing diarrheas due to organic disease. With a low rate there existed little chance of organic involvement, but with an elevated rate something was seriously wrong with the bowel such as stenosing enteritis, beginning ulcerative colitis, a tuberculous or cancerous lesion, or a bacillary dysentery. Nervous causes of diarrhea in their early stages can be differentiated from organic disease.

One of the most important applications of the B.S.R. is in the diagnosis of the acute surgical abdomen. The sedimentation reading in cases of unperforated acute appendicitis is almost always uniformly normal, but in all other acute abdominal or extra-abdominal conditions simulating acute appendicitis the B.S.R.'s are consistently abnormal. Only the cases of appendicitis with abscess formation or peritonitis give abnormal readings. Some of the conditions which simulate acute appendicitis are acute salpingitis, acute cholecystitis, genito-urinary infection, pneumonia, sickle cell anemia, and rheumatic fever. An individual with one of these diseases may be saved a needless appendectomy by the use of B.S.R.

The blood sedimentation test was originally devised for gynecology and obstetrics. Changes with normal pregnancy have already been discussed. Sharp rises in the sedimentation rate occur in ruptured ectopic pregnancies or with hemorrhage into the peritoneal cavity. In incomplete abortions with retention of secundines and with the onset of sepsis, the readings rise rapidly.[13] Interval determinations of the B.S.R. are used to follow the progress of adenexal diseases so that the optimum time for operation can be chosen.

The B.S.R. has been said to be of little value in liver disorders because of the wide variability in plasma constituents. Goldbloom and Rosen[18] report the B.S.R. of little value in the early stages of acute hepatitis because of a lag in the acceleration of sedimentation. However, they do find the B.S.R. helpful in determining when recovery from acute infectious hepatitis has occurred, because it drops to normal when recovery is complete. In 26 cases of acute hepatitis, the B.S.R. was found more reliable than the cephalin flocculation test in determining when recovery was complete enough to permit the patient to resume his usual activities without fear of relapse.

Psychiatric and neurological disturbances of functional origin do not affect the B.S.R., but in neurological conditions associated with tissue destruction, such as malignant tumors or syphilis, the rate is increased. In uncomplicated polio and other viral infections of the CNS, the B.S.R. is elevated in only about five per cent of the cases at the beginning of the disease.[17] The differentiation of polio and other viral and bacterial infections of the CNS which simulate it cannot be made. Therefore, the diagnostic lumbar puncture can in no cases be replaced by the B.S.R.

The B.S.R. is valuable in some cardiovascular diseases, particularly rheumatic fever and coronary thrombosis. In cardiac disorders not accompanied by active disease, the rate is seldom accelerated. Caution must be practiced in patients with congestive failure, for this is the most prevalent cause of the failure of the B.S.R. to rise in response to existing pathological states. The reason for this retardation is unknown.

The B.S.R. in coronary occlusion and myocardial infarction is a most useful diagnostic procedure, especially when the temperature is normal or nearly so. The test is often valuable in the differential diagnosis of precordial pain, in that angina of effort usually has no marked effect upon the sedimentation.

After myocardial infarction, the rate is seldom elevated before 48 hours, but is increased in almost

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all cases after 72 hours. In a series of 100 cases of proven myocardial infarction reported by Plotz,[26] 97 had elevated rates. The elevation persists for four to eight days, and in most cases the rate is back to normal within five weeks. The rate returns to normal as the infarct heals. If the elevation persists for more than five weeks, extracardial causes should be suspected. When the rate remains high after the patient is clinically well, the patient may be permitted out of bed cautiously after the 42nd day.[26] Thus, the B.S.R. is useful as a guide in management, particularly in regard to convalescent ambulation.

The increased rates of untreated cardiovascular syphilis usually return to normal following successful treatment. In bacterial endocarditis, elevated B.S.R.'s are due to multiple factors which make diagnostic interpretations difficult in diagnosis, but the rates may be of value in evaluating results of penicillin therapy.

In the differentiation of quiescent from active states of rheumatic fever, assistance may be provided by B.S.R.'s particularly when other signs of disease fail to appear. While a raised rate is present, the danger of carditis is not passed. A secondary sharp rise is suggestive of rheumatic carditis. Systolic murmurs can be considered of little consequence only if a normal B.S.R. exists. Rheumatic nodules indicate widespread infection, but often lag behind the B.S.R. changes. Fallacies in sedimentation may be due to blood disorders, liver damage, allergic states, metabolic disorder, upper respiratory infections and cold, tonsillitis, and congestive failure.

One of the most difficult problems encountered in the clinical management of rheumatic fever is determination of the point at which the rheumatic process can be judged to have become inactive. The B.S.R. has come to be widely accepted as the single most reliable laboratory evidence of the presence or absence of rheumatic activity.

The B.S.R. is almost an indispensible step in the differential diagnosis of arthritic conditions and in cases with symptoms referable to the spine. It is a measure of the activity and severity of pathology in joint conditions and is probably related to the total mass of fibrinoid necrosis. Arthritis can be separated into two groups by the sedimentation rate. One group has a normal B.S.R. and includes the cases of fibrositis and osteoarthritis. The other group of rheumatoid arthritis and ankylosing spondylitis has a rapid rate except in exceptional cases. Gout manifests a fluctuating rate of little value. No claim for the cure of rheumatoid arthritis is acceptable without supporting unequivocal evidence of the B.S.R. In Still's disease a fall in the rate, if persisting over a period of several weeks, is often a herald of commencing recovery, although joint symptoms may not improve until some time later. The B.S.R. is free from bias and is almost essential in the management of chronic rheumatoid diseases.

The B.S.R. may be used in acute nephritis as an index of activity. In cases of urethritis the sedimentation is not unusual, but in the more serious infections such as acute prostatitis, epidimitis, pyelitis and cystitis, the rates are increased. Vesical and renal calculi, prostatic hypertrophy, hydronephrosis and benign tumors, when not complicated by infections, cause no increase in the B.S.R. Rapid rates are found in association with hypernephroma and prostatic carcinomas, as stated earlier.

Many other specific diseases alter the B.S.R., but are of lesser importance. In blood diseases the rates are frequently abnormal; leukemia and pernicious anemia cause large rises. Acute poisoning with lead, arsenic, alcohol, and other toxic substances accelerates the rate. In diabetes mellitus and thyrotoxicosis, the effects are too variable for the test to be of much assistance.

Summary and Conclusion

The blood sedimentation rate (B.S.R.) is a nonspecific laboratory test of the whole blood which gives objective information of a general character. The nature of the settling phenomenon is not clear because of the multiplicity of influencing factors. Disease states with infection and tissue destruction seem to alter the plasma constituents, especially fibrinogen. This leads to increased rouleaux formation and abnormally accelerated rates.

The B.S.R. provides valuable data concerning diagnosis, treatment and prognosis. It reflects the nature, extent and activity of a disease process. The disease entities in which the B.S.R. is of particular value include tuberculosis, neoplasms, acute surgical abdomens, pelvic pathology, coronary thrombosis, rheumatic fever, and rheumatoid arthritis.

The clinician must assess the B.S.R. in the light of the existing circumstances and must, therefore, know the overall condition of his patient. Misinterpretations can be minimized if he is cognizant of factors which are extraneous to the primary disease process, such as inferior technique, drugs, hidden disease, or concomitant disorders. The physician will find the B.S.R. a valuable aid in clinical evaluations if he appraises it correctly and correlates it with other available clinical data.

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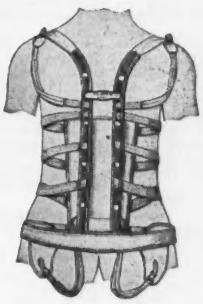

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THE KANSAS PRESS LOOKS AT MEDICINE

Editor's Note. In this section the Journal reproduces editorials relating to medicine which have appeared in the lay press. An effort is made to include both favorable and unfavorable comments, and the Editorial Board in no instance assumes responsibility for the opinions expressed.

Wholesale Slander

Rear Admiral Lamont Pugh, navy surgeon general, let loose a bitter blast at physicians and dentists who, he says, are trying in every way they can to avoid entering military service because of their greed and selfishness. All they think about is making "easier and quicker money," the surgeon general charged.

Placing a stigma on these two professions for the reason a comparatively few may shirk military service (it has been that way in every war with persons in all vocations) is wholly uncalled for and reflects no credit on the rear admiral. There are upward of three million men in military service. Total U. S. population has passed the 157 million mark. An acute shortage of doctors and dentists existed in nearly every community, large and small, before this country became engaged in its "police action" in Korea. Unless it's an emergency, people often have to wait days—maybe weeks—for an appointment with a doctor or dentist. There are rural areas far removed from medical centers which haven't had a resident physician or dentist since shortly after the outbreak of World War II.

The needs of the military must be served first. Certainly no one would want to see the boys in Korea or those at training bases denied adequate service by doctors and dentists. There are, however, disturbing reports of more members of these two professions than are needed at many of the training bases. It will take more than the word of Rear Admiral Pugh to convince people doctors and dentists generally are evading military service. In World War II many military hospitals here at home were greatly over-staffed. Since the rear admiral has asked for it, it might be well for the Congress to name a committee of investigation to find out if Pugh's charges can in any way be substantiated.—*Hays Daily News, November 19, 1952.*

* * *

Americans Take Care of Health

The American Medical Association reports that by the first of the year 90,000,000 Americans will be covered by some form of voluntary health insurance.

It is pointed out that the first voluntary plan came into existence only 30 years ago in Seattle. At present every state in the Union has voluntary health insurance sponsored either by medical societies or by other organizations. The major insurance companies also write health policies which can be made to cover virtually every contingency.

Another notable development in the health situation is the growth of community health councils. Nine years ago there were only 43 such councils. Now there are 1,190.

This great progress has come about by voluntary individual action. It explains why the scheme for compulsory government health insurance administered by bureaucrats has been turned down so emphatically by Congress and why such compulsory insurance has received no widespread public support.

Health problems still remain. Some of them, such as catastrophic illness, are extraordinarily difficult. They are being studied by the medical profession and by various agencies with the promise of eventual victory over some of the diseases which now are so baffling.

It is a real cause for satisfaction to be able to look ahead to even greater improvements in the general health picture through action in various lines by free individuals.—*Dodge City Globe, November 18, 1952.*

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ABSTRACTS FROM CURRENT LITERATURE

Acrodynia

Acrodynia. By Josef Warkany and Donald Hubbard, Am. Jnl. Dis. Child., 81:3, 335-373, Mar., 1951.

The outstanding symptoms of acrodynia are pink hands and feet, desquamation, scarlet cheeks and tip of nose, alopecia, salivation, loss of several or all of teeth, occasional loss of nails or phalanges, excessive perspiration, evanescent rashes, marked hypotonia, itching, burning, severe pain in the extremities, increased pulse rate, increased blood pressure, photophobia, insomnia and apathy alternating with extreme irritability.

Acrodynia in the past has frequently been considered as due to arsenic intoxication.

The authors present 23 cases of acrodynia and the source of the mercury responsible:

"Teething powders" containing calomel.....	11
Calomel and santonin for worm treatment..	3
Calomel	3
Ammoniated mercury ointment	2
Bichloride of mercury diaper rinse.....	4

One patient had 1000 micrograms of mercury per liter of urine.

The treatment consists of intramuscular injections of a 10 per cent solution of dimercaprol in oil preceded by 0.5 ml. of a two per cent novocain. Three milligrams per Kg. of body weight was given every four hours for 48 hours, then every six hours for 24 hours, then every 12 hours for seven days.

It is suggested that the exposure to mercury of hypersensitive children is the most important factor in the causation of infantile acrodynia. Older children and adults do not show this apparent sensitivity, probably due to higher tolerance.

It is possible that metal drugs and toxic substances other than mercury produce disease pictures resembling acrodynia.

The effectiveness of dimercaprol (BAL) in the treatment of acrodynia could not be clearly demonstrated in this series. It is probably much more efficacious in the acute mercury poison cases.—*D.R.D.*

* * *

Commissurotomy in Mitral Stenosis

Indications for Commissurotomy in Mitral Stenosis. By O. Henry Janton, Robert P. Glover and Thomas J. E. O'Neill, Am. Jnl. Med., 12:6, 621-625, June, 1952.

This article is one of several on various aspects of mitral commissurotomy in the June issue of this journal.

The authors have had over 400 operated cases in this category, and they employ that data plus the literature as a basis for their opinions. Credit is given Sir Lauder Brukton who, in 1902, first said that the only logical method of interrupting the relentless chain of events in mitral stenosis is that of direct surgical reconstruction of the valve itself. He realized that drug therapy was merely an attack on the effects of the disease rather than a correction of its mechanical cause. He considered "lengthening of the stenotic slit" as mandatory, but 46 years elapsed before the operation was possible.

The authors state that events have now proved that an attitude of reticence is no longer justified in considering surgery for the patient with mitral stenosis. They state that the greatest single factor in the successful surgical handling of the patient with mitral stenosis is the proper selection of cases. Their overall mortality has been about 10 per cent, though in well over half their series the mortality has been under five per cent. This favorable group included patients classed reasonably early to moderately advanced. Seventy-eight per cent of this group obtained "clinical cures" though 12 per cent were unimproved.

The authors emphasize that surgical reconstruction of a damaged valve is but a major adjunct in the continuing care of the rheumatic victim. They have seen no setback in patients who were helped in the four-year follow-up period.

They categorize the selection of patients for this therapy under seven headings:

1. The history.
2. Age of the patient (as early as four, usually in early adulthood). Fifty and older are less favorable risks.
3. Valvular defects other than mitral stenosis, particularly aortic, should be considered. The favor-

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able case is pure stenosis, and it must be the dominant lesion to justify surgery.

4. Cardiac size as an index of failure has prognostic value, but chamber enlargement is more important. Left ventricular enlargement speaks for other problems and makes the mitral lesion less apt to be dominant.

5. Electrocardiographic evidence of left ventricular hypertrophy is against this therapy. Right axis deviation should be present.

6. Functional capacity, markedly impaired, is unfavorable, though even congestive failure and huge hearts have, when the former was controlled, proved no obstacle.

7. Complicating factors: arrhythmias and previous thrombotic episodes do not contraindicate but it is emphasized that: RHD (active) and SBE do.

A confusing five-stage category classification is offered in which the functional capacity and irreversible nature of the picture are combined in an attempt to set up a workable rule of thumb. The authors' recitation of facts and experience gives their article value.—*P.W.M.*

How many doctors does it take to make a doctor? A survey on the subject was recently made to determine the basic needs of the schools in the event of stepped-up mobilization of doctors.

Staffing patterns in the 72 four-year medical schools were found to vary widely. The "average" school had 26 full-time faculty members per 100 students in February, 1951, the time of the survey. The most heavily staffed school reported 62 faculty members per 100 students, the lowest only 10 per 100.

A considerable number of patients with active tuberculosis refuse to accept hospitalization and remain at home to infect others. Since the advent of streptomycin, home treatment has become increasingly apparent. Whatever the cause—lack of understanding, financial worries or the false hope that adequate treatment is possible at home—home management of active tuberculosis is extremely difficult under the best of circumstances—is rarely adequate and often dangerous, and every effort should be made to have the patient accept hospitalization.—*Paul S. Phelps, M.D., and Reginald C. Edson, M.D., Conn. State Med. J., May, 1592.*

Evidence that red blood cells from an Rh-positive baby can enter the mother's blood stream and sensitize Rh-negative women during pregnancy is described as one of the most important contributions to obstetrics of 1952 by Dr. N. J. Eastman, professor of obstetrics at John Hopkins University Medical School.

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